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—SPACE SHUTTLE—

**FOREBODY AND VERTICAL
STABILIZER EFFECTS ON
DIRECTIONAL STABILITY OF A
REUSABLE LOX/RP (061) BOOSTER
AR 12161-2**

by

**C.E. Roth, TBC
L.L. Watts, TBC
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**MSFC 14 INCH
TRISONIC WIND TUNNEL**

N72-22893

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STABILIZER EFFECTS ON DIRECTIONAL STABILITY
OF A REUSABLE LOX/RP (061) BOOSTER AR
12161-2 SADSAC/Space C.E. Roth, et al
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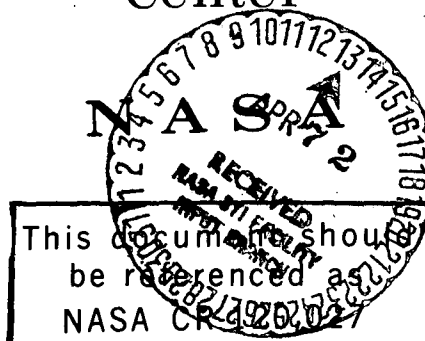
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**Marshall Space Flight
Center**

SADSAC SPACE SHUTTLE
AEROTHERMODYNAMIC
DATA MANAGEMENT SYSTEM

CONTRACT NAS8-4016
MARSHALL SPACE FLIGHT CENTER

SPACE DIVISION  **CHRYSLER
CORPORATION**



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SADSAC/SPACE SHUTTLE
WIND TUNNEL TEST DATA REPORT

CONFIGURATION: AR 1216I-2, 0.003366 Scale

TEST PURPOSE: To Investigate the Forebody and Vertical Stabilizer Effects
on Directional Stability of Booster Configurations

TEST FACILITY: NASA/MSFC 14-Inch Trisonic Tunnel

TESTING AGENCY: The Boeing Company

TEST NO. & DATE: MSFC TWT 513; December 6, 1971

FACILITY COORDINATOR: Jim Weaver, NASA/MSFC

PROJECT ENGINEER(S): C. E. Roth, L. L. Watts, and
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MSFC 14 INCH TRISONIC WIND TUNNEL

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FOREBODY AND VERTICAL STABILIZER EFFECTS
ON DIRECTIONAL STABILITY OF A REUSABLE
LOX-RP (061) BOOSTER AR 1216I-2

By C. E. Roth, L. L. Watts and R. W. Ainsworth

ABSTRACT

This was an investigation of forebody and vertical stabilizer effects on the directional stability of some Reusable LOX/RP Booster configurations.

The test was conducted at the MSFC 14-Inch Trisonic Tunnel starting Monday, December 6, 1971, and continued through Saturday December 11, 1971, for a total of 66 occupancy hours. Configurations tested included a cylindrical body with two axisymmetrical noses, one with and without canopy, one delta wing, located in two positions, five vertical tails (including a "V" tail), two having split rudders, ventral fins, two sets of chines, three airbreathing engine pods, and rocket engine shrouds. The model scale was 0.003366.

NOMENCLATURE

(General)

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
α	ALPHA	angle of attack, angle between the projection of the wind X_w -axis on the body X, Z-plane and the body X-axis; degrees
β	BETA	sideslip angle, angle between the wind X_w -axis and the projection of this axis on the body X-Z-plane; degrees
ψ	PSI	yaw angle, angle of rotation about the body Z-axis, positive when the positive X-axis is rotated toward the positive Y-axis; degrees
ϕ	PHI	roll angle, angle of rotation about the body X-axis, positive when the positive Y-axis is rotated toward the positive Z-axis; degrees
ρ		air density; K_g/m^3 , slugs/ft ³
a		speed of sound; m/sec, ft/sec
V		speed of vehicle relative to surrounding atmosphere; m/sec, ft/sec
q	Q(PSI) Q(PSF)	dynamic pressure; $1/2\rho V^2$, psi, psf
M	MACH	Mach number; V/a
RN/L	RN/L	Reynolds number per unit length; million/ft
p		static pressure; psi
P		total pressure; psi
C_p	CP	pressure coefficient; $(p-p_\infty)/q$

NOMENCLATURE (Continued)

Reference & C. G. Definitions

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
S		wing area; m^2 , ft^2
S	SREF	reference area; m^2 , ft^2
\bar{c}		wing mean aerodynamic chord or reference chord; m, ft, in (see l_{ref} or LREF)
l_{ref}	LREF	reference length; m, ft, in.; (see \bar{c})
b_{ref}	BREF	wing span or reference span; m, ft, in
A_b		base area; m^2 , ft^2 , in^2
c. g.		center of gravity
MRP	MRP	abbreviation for moment reference point
	XMRP	abbreviation for moment reference point on X-axis
	YMRP	abbreviation for moment reference point on Y-axis
	ZMRP	abbreviation for moment reference point on Z-axis

NOMENCLATURE (Continued)

Axis System General

<u>SYMBOL</u>	<u>DEFINITION</u>
F	force; F, lbs
M	moment; M, in-lb

<u>Subscript</u>	<u>Definition</u>
N	normal force
A	axial force
L	lift force
D	drag force
Y	force or moment about the Y axis
Z	moment about the Z axis
X	moment about the X axis
s	stability axis system
w	wind axis system
ref	reference conditions
∞	free stream conditions
t	total conditions
b	base

NOMENCLATURE (Continued)
Body & Stability Axis System

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
<u>Body Axis System</u>		
C_N	CN	normal force coefficient; F_N/qS
C_A	CA	axial force coefficient; F_A/qS
C_{A_b}	CAB	base axial force coefficient; $\begin{bmatrix} -1 \\ \end{bmatrix} \begin{bmatrix} (p_b - p_\infty)/q \end{bmatrix} (A_b/S)$
C_{A_f}	CAF	forebody axial force coefficient; $C_A - C_{A_b}$
C_n	CYN	yawing moment coefficient; $M_Z/qS b_{ref}$
C_l	CBL	rolling moment coefficient; $M_X/qS b_{ref}$
<u>Common to Both Axis Systems</u>		
C_m	CLM	pitching moment coefficient; $M_Y/qS l_{ref}$
C_y	CY	side force coefficient; F_Y/qS
<u>Stability Axis System</u>		
C_L	CL	lift force coefficient; F_L/qS
C_D	CD	drag force coefficient; F_D/qS
C_{D_b}	CDB	base drag coefficient
C_{D_f}	CDF	forebody drag coefficient; $C_D - C_{D_b}$
C_n	CLN	yawing moment coefficient; $M_{Z,s}/qS b_{ref}$
C_l	CSL	rolling moment coefficient; $M_{X,s}/qS b_{ref}$
L/D	L/D	lift-to-drag ratio; C_L/C_D
L/D_f	L/DF	lift to forebody drag ratio; C_L/C_{D_f}

NOMENCLATURE (Continued)

Surface Definitions

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
i_t	HORIZT	horizontal tail incidence; positive when trailing edge down; degrees
δ		symmetrical surface deflection angle; degrees; positive deflections are:
	AILRON	aileron - total aileron deflection; (left aileron - right aileron)/2
	CANARD	canard - trailing edge down
	ELEVON	elevon - trailing edge down
	ELEVTR	elevator - trailing edge down
	FLAP	flap - trailing edge down
	RUDDER	rudder - trailing edge to the left
	SPOILER	spoiler - trailing edge down
	TAB	tab - trailing edge down with respect to control surface
δ		antisymmetrical surface deflection angle, degrees; positive trailing edge down:
	AIL-L	left aileron - trailing edge down
	AIL-R	right aileron - trailing edge down
	ELVN-L	left elevon - trailing edge down
	ELVN-R	right elevon - trailing edge down
	SPLR-L	left spoiler - trailing edge down
	SPLR-R	right spoiler - trailing edge down

<u>SURFACE SUBSCRIPTS</u>	<u>DEFINITION</u>
a	aileron
b	base
c	canard
e	elevator or elevon
f	flap
r	rudder or ruddervator
s	spoiler
t	tail

ADDITIONS TO SADSAC NOMENCLATURE
FOR
MSFC TWT 513

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
	CPB(AVG)	average base pressure coefficient
	CAT	axial force coefficient corrected to freestream pressure at the base region
$\delta C_m / \delta C_n$	DCIMCN	derivative of pitching moment coef- ficient with respect to normal force coefficient
$\delta C_n / \delta C_y$	DCYNCY	derivative of yawing moment coef- ficient with respect to side force coefficient

CONFIGURATIONS INVESTIGATED

The following is a description of body components investigated during the test:

BOOSTER BODY: Model 979-061 (Reusable LOX-RP Configuration)

BODIES: Cylindrical with Axisymmetrical Nose

	<u>ℓ</u>	<u>d</u>	<u>ℓ/d</u>	<u>Engine Shrouds</u>
B ₄ (049 Body)	6.86 in (169.8 ft)	1.333 in (33 ft)	5.146	On
B ₅ (061 Body)	6.14 in (152.0 ft)	1.333 in (33 ft)	4.606	On
B ₅ ^C (With Cab)	6.14 in (152.0 ft)	1.333 in (33 ft)	4.606	On
B ₆ (Hemisphere Nose)	5.726 in (141.8 ft)	1.333 in (33 ft)	4.296	On

WINGS:

	<u>Area</u>	<u>Section</u>	<u>Span</u>	<u>AR</u>	<u>λ</u>	<u>Λ_{LE}</u>
W ₁₁ & W ₁₁ ^A	9000 sq.ft.	0006-64	140.0 ft	2.177	0.1524	51.5°

VERTICAL TAILS:

	<u>Area</u>	<u>Section</u>	<u>Span</u>	<u>AR</u>	<u>λ</u>	<u>Λ_{LE}</u>
V ₅ & V ₅ ^A	1500 sq.ft.	0008-65	47.459 ft	1.5	0.5	45°
V ₇	1500 sq.ft.	0008-65	54.763 ft	2.0	0.25	43.3°
V ₈	2000 sq.ft.	0008-65	63.255 ft	2.0	0.25	43.3°
V ₉ (Vee Tails)	750 sq.ft. ea.	0008-65	38.720 ft	2.0	0.25	43.3°
V ₁₀ (Twin Ventrals)	180 sq.ft. ea.	-	16.587 ft	1.34	1.0	0°

CHINE:

	<u>Area</u>	<u>Exp. Span</u>	<u>Length</u>	<u>Location</u>
C ₃		0.08/side	1.440	MS 1.057 (LE) (1761)
C ₄		0.08/side	0.767	MS 1.730 (LE) (1561)

PROPULSION PODS: - AIRBREATHING ENGINES

(E₁ - Concealed Nose Location - B₄)

E₂ - Underwing Pods

E₃ - External Nose Pods

E₄ - Upper Body Pods (E₄^F - Forward Loc., E₄^A - Aft Loc.)

SHROUDS:

S₁ - Booster Rocket Engine Shrouds

BODY FLAP:

F₁ - Flap T.E.M.S. = 7.202"

Incidence = 2°
(To match wing incidence)

F₂ - Flap T.E.M.S. = 7.539" (+100" FS)

Incidence = 2°
(To match wing incidence)

Combinations of the components investigated are:

B_5

$B_4W_{11}^A F_2 S_1 V_5^A$

$B_5^C S_1$

$B_4W_{11}^A F_2 S_1 V_7$

$B_5^C W_{11}^A F_2 S_1$

$B_5^C W_{11}^A F_2 S_1 V_8 E_2$

$B_5 W_{11}^A F_2 S_1 V_7$

$B_5^C W_{11}^A F_2 S_1 V_9 E_2$

$B_5^C W_{11}^A F_2 S_1 V_7$

$B_5^C W_{11}^A F_2 S_1 V_7 E_3$

$B_5^C W_{11}^A F_2 S_1 V_7 E_2$

$B_5^C W_{11}^A F_2 S_1 V_7 E_4^F$

$B_5^C W_{11}^A F_2 S_1 V_7 E_2 C_4$

$B_5^C W_{11}^A F_2 S_1 V_7 E_4^A$

$B_5^C W_{11}^A F_2 S_1 V_7 E_2 C_3$

$B_6 W_{11}^A F_2 S_1 V_7 E_2$

$B_5^C W_{11}^A V_{10} S_1 V_7 E_2$

$B_4 W_{11} F_1 S_1 V_5^A$

$B_5^C W_{11}^A V_{10} S_1 V_7$

TEST FACILITY

The Marshall Space Flight Center 14" x 14" Trisonic Wind Tunnel is an intermittent blowdown tunnel which operates by high pressure air flowing from storage to either vacuum or atmospheric conditions. A Mach number range from .2 to 5.85 is covered by utilizing two interchangeable test sections. The transonic section permits testing at Mach 0.20 through 2.50, and the supersonic section permits testing at Mach 2.74 through 5.85. Mach numbers between .2 and .9 are obtained by using a controllable diffuser. The range from .95 to 1.3 is achieved through the use of plenum suction and perforated walls. Mach numbers of 1.44, 1.93 and 2.50 are produced by interchangeable sets of fixed contour nozzle blocks. Above Mach 2.50 a set of fixed contour nozzle blocks are tilted and translated automatically to produce any desired Mach number in .25 increments.

Air is supplied to a 6000 cubic foot storage tank at approximately -40°F dew point and 500 psi. The compressor is a three-stage reciprocating unit driven by a 1500 hp motor.

The tunnel flow is established and controlled with a servo actuated gate valve. The controlled air flows through the valve diffuser into the stilling chamber and heat exchanger where the air temperature can be controlled from ambient to approximately 180°F . The air then passes through the test section which contains the nozzle blocks and test region.

Downstream of the test section is a hydraulically controlled pitch sector that provides a total angle of attack range of 40° ($\pm 10^{\circ}$). Sting offsets are available for obtaining various maximum angles of attack up to 25° .

TEST CONDITIONS

Table 1 presents the range of test conditions for which data were recorded. The model was mounted on an internal balance and supported by a bent sting which was utilized to provide fixed nominal α positions for zero angle of β for the pitch runs, and fixed angles of α for sideslip runs. Pitch runs were made with the model upright while sideslip runs were made in the pitch plane with the model, balance and sting rolled 90° . Pitch data were obtained to $+60^\circ$ utilizing the bent sting. Yaw data were obtained through a sector range of $\pm 6^\circ$ at fixed angles of attack of 10° , 15° and 25° .

Boundary layer trip strips were located on the model as shown in Figure 15. No. 180 grit (0.0035") was used for all Mach numbers.

Schlieren photographs were taken for selected Mach numbers.

Base pressures were measured for two positions at the base of the model located approximately 5 o'clock and 11 o'clock when viewing the model from the rear. Balance chamber pressure was also measured. The wing was set at an incidence of $+2^\circ$ for both its fore and aft locations.

Balance #227 was used throughout the test.

DATA REDUCTION

Six component aerodynamic force and moment data were recorded using an internal strain gage balance. Base pressures ($C_{pb\#1}$ and $C_{pb\#2}$) and chamber pressure (C_{p_c}) were recorded and utilized to correct the axial force measured data (C_{A_T}) to a condition corresponding to free stream pressure acting at the base region.

$$C_{A_T} = C_{A_F} + C_{A_B}$$

$$C_{A_B} = \left(\frac{C_{PB1} + C_{PB2}}{2} \frac{A_B}{S_{ref}} \right) + (C_{p_c} \times \frac{A_c}{S_{ref}})$$

$$C_{P_B} = \frac{\Delta P_B}{q}$$

$$C_{P_c} = \frac{\Delta P_c}{q}$$

C_L and C_D were computed based on C_{A_F} .

DATA REDUCTION DETAILS

1. MOMENT REFERENCE CENTER LOCATION

$x = 1.4821$ inches ahead of booster base (50.739% $W_{11}C_R$)

$y = 0$ inches from centerline of model

$z = 0$ inches from centerline of model

2. MODEL BASE AREA

Total Base Area = 1.5580 Sq. In. (955 Sq. Ft., Nominal)

$A_B = 0.9567$ Sq. In. (Includes Shroud Base)

$A_C = 0.6013$ Sq. In. (Cavity Area)

3. REFERENCE AREAS

$W_{11} = 14.6836$ Sq. In. (9000 Sq. Ft.)

Wing Off = 14.6836 Sq. In. (9000 Sq. Ft.)

4. REFERENCE LENGTHS

	LONGITUDINAL	LATERAL
W_{11}	$C_R = 4.508$ In.	$b = 5.655$ In.
Wing Off	$C_R = 4.508$ In.	$b = 5.655$ In.

TABLE 1

TEST CONDITIONS
TEST TWT #513

MACH NUMBER	REYNOLDS NUMBER per unit length	DYNAMIC PRESSURE (pounds/sq. inch)	STAGNATION TEMPERATURE (degrees Fahrenheit)
0.60	5.1×10^6	4.3	100°F (nominal)
0.90	6.4×10^6	7.4	
0.95	6.4×10^6	7.8	
1.00	6.5×10^6	8.1	
1.10	6.7×10^6	8.7	
1.20	6.8×10^6	9.1	
1.46	7.5×10^6	10.8	
1.96	7.6×10^6	11.0	
2.80	7.8×10^6	9.6	
3.50	7.1×10^6	6.9	
4.96	5.4×10^6	3.1	

BALANCE UTILIZED: #227

CAPACITY: #227

CAPACITY:

COEFFICIENT
TOLERANCE:

NF 125 lbs (at gages)
 SF 45 lbs
 AF 25 lbs
 PM 300 in.lbs.
 YM 100 in.lbs.
 RM 50 in.lbs.

COMMENTS:

TABLE II.

TEST TWT # 513 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES					NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
		A	B	def	deg	dr	dx	dy		0.6	0.9	1.2	1.96	2.8	3.5	4.96			
R5325A	B4W11F5,V5A	A	0°	0°	0°	0°	0°			001%		002%							
20A	B4W11F5,V5A	V	V							005%		004%							
20Q			10° B							006%		007%							
20H			15° V									008%							
20L			25° V									009%							
20M			M 0°																
20K			K V																
21G	B4W11F5,V7		10° B							015%		016%							
21H			15° V									017%							
21L			25° V									018%							
29L			V									019%							
29H			15° V									011%							
29Q			10° V									012%							
19A	B5W11F5,V7		A 0°							014%		013%							
19Q			10° B							020%		019%							
19H			15° V									018%							
19L			25° V									018%							
19M			M 0°																
19K			K V																

COEFFICIENTS:

$$\alpha A = 0.2, 4.6, 8.10, 12.14, 16.18, 20.22, 24.26, 28.30, 32.34, 36.38, 40.42, 46.48, 50.52, 54.56, 58.60$$

a or B

$$\alpha K = 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60$$

SCHEDULES

$$B B = -6, -4, -2, 0, 2, 4, 6$$

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TEST TWT #5/3 DATA SET COLLATION SHEET

SHEET 2 of 5.

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
		a	b	$\delta\alpha$	$\delta\beta$	$\delta\gamma$	$\delta\epsilon$		0.6	0.9	1.2	1.96	2.8	3.5	4.96			
R5305A	B5W11AF2S1V7	A	0°	0°	0°	±30°	0°		03%	03%								
05M		M	✓															
05K		K	✓															
05G		10° B							031%	021%								
05H		15°	✓						023%	027%								
05L		25°	✓															
06A	B5W11AF2S1V7E2	A	0°						037%	036%								
06M		M	✓															
06K		K	✓															
06G		10° B							025%									
06H		15°	✓								024%	026%						
06L		25°	✓															
22A		A	0°			0°					038%							
22G		10° B							046%									
22H		15°	✓								039%							
22L		25°	✓															
	B5W11AF2S1V7E2	A	0°			±30°												
14G		10° B							061%									
		15°	✓															
14L		25°	✓															

COEFFICIENTS:

a or b
SCHEDULESSEE SHEET #1

NASA-MSFC-MAF

TEST TWT #513 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)							
		a	B	$\delta\epsilon_1$	$\delta\epsilon_2$	$\delta\epsilon_3$	$\delta\epsilon_4$		0.6	0.9	1.2	1.96	2.0	3.5	4.96	
R53114	B5W11AF25, E2V8	10°	B	0°	0°	±30°	0°		0.6%							
11H		15°	V													
11L		25°	V													
12A	B5W11AF25, E2V4	A	0°			0°			0.4%	0.3%						
12M		M	V													
12K		K	V													
12G		10°	B						0.4%							
12H		15°	V													
12L		25°	V													
09A	B5W11AF25, V7E3	A	0°			±30°			0.58%	0.51%						
09M		M	V													
09K		K	V													
09G		10°	B						0.3%	0.54%						
09H		15°	V													
09L		25°	V													
10A	B5W11AF25, V7E4	A	0°						0.08%	0.61%						
10G		10°	B						0.64%	0.63%						
10H		15°	V													
10L		25°	V													

1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICIENTS: _____

_____ IDPVAR(1) IDPVAR(2) INDV

a or B
SCHEDULES

SEE SHEET #1

TEST TWT #513 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS / VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
		A	B	$\delta\epsilon_1$	$\delta\epsilon_2$	$\delta\epsilon_3$	$\delta\epsilon_4$		0.6	0.9	1.2	1.96	2.8	3.5	4.96			
R53B5	B5W1/AF2S1V7E4A	10°	B	0°	0°	0°	±30°	0°	052%	051%	050%	049%	048%	047%	046%			
13H		15°	V															
13L		25°	V															
08A	B5W1/AF2S1V7E2C3	A	0°						078%		078%		11%					
08M		M	V															
08K		K	V															
08G		10°	B						08%		081%	08%						119%
08H		15°	V															
08L		25°	V															
07M	B5W1/AF2S1V7E2C4	M	0°											09%	112%			
07L		25°	B											113%				
18A	B6W1/AF2S1V7E2	A	0°						075%	076%		07%						
18M		M	V											109%				
18K		K	V												12%	123%		
18G		10°	B						074%	073%								
18H		15°	V											074%				
18L		25°	V											09%				
04G	B5W1/AF2S1	10°	V						068%	069%				070%	071%			
04H		15°	V															
04L		25°	V											104%				

COEFFICIENTS:

a or B

SCHEDULES

SEE SHEET #1

IDPVAR(1) IDPVAR(2) INDV

NASA-MSPC-MAP

TEST TWT #5/3 DATA SET COLLATION SHEET
☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
		a	b	$\delta\epsilon_L$	$\delta\epsilon_R$	$\delta\epsilon_T$	$\delta\epsilon_A$		0.6	0.9			1.2	1.9	2.8	3.5	4.96	
R5305C	B5 ^C W1 ^A F2.5 ^I V ₇	0°	C	0°	0°	±30°	0°		0.6%				0.81%					
05X	✓ (TN/BOFF)	✓	✓	✓	✓	✓	✓		0.81%									
03L	B5 ^C S ₁	25°	B	—	—	—	—											
01A	B ₅	A	0°						0.85%				0.86%					
01M		M	✓															
01D		10°	C						0.84%									
01H		15°	B										0.83%					
01L		25°	✓	✓	✓	✓	✓							11.7%				
27G	B5 ^C W1 ^A V10.5 ^I V ₇	10°	B	0°	0°	±30°	0°		0.65%									

1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICIENTS: _____

a or b _____

SCHEDULES _____

SEE SHEET #1 _____

IDPVAR(1) IDPVAR(2) INDV _____

TABLE III.
DIMENSIONAL DATA

MODEL COMPONENT: BODY - B₄

GENERAL DESCRIPTION: 0.003366 Scale RS-IC Cylindrical Body with an
Axisymmetrical Nose

DRAWING NUMBER: 1216-10 and 11

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Length	<u>169.98 ft.</u>	<u>6.866 in.</u>
Max. Width	<u>33.075 dia.</u>	<u>1.336 in. dia.</u>
Max. Depth	<u>-</u>	<u>-</u>
Fineness Ratio	<u>5.15/1</u>	<u>5.15/1</u>
Area		
Max. Cross-Sectional	<u>858.75 ft²</u>	<u>1.401 in²</u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u>955</u>	<u>1.55 in²</u>

TABLE III. (CONTINUED)

MODEL COMPONENT: BODY - B₅ CYLINDRICAL BODY WITH A BLUNT OGIVE NOSEGENERAL DESCRIPTION: _____

_____DRAWING NUMBER: 1216-55DIMENSIONS:

	<u>FULL-SCALE</u> FT/FT ²	<u>MODEL SCALE</u> IN/IN ²
Length	<u>152</u>	<u>6.14</u>
Max. Width	<u>33.075</u>	<u>1.336</u>
Max. Depth	_____	_____
Fineness Ratio	<u>4.59/1</u>	<u>4.59/1</u>
Area		
Max. Cross-Sectional	<u>858.75</u>	<u>1.401</u>
Planform	_____	_____
Wetted	_____	_____
Base	<u>955</u>	<u>1.55</u>

TABLE III. (CONTINUED)

MODEL COMPONENT: BODY - B₅^C CYLINDRICAL BODY WITH A BLUNT OGIVE NOSE AND CAB

GENERAL DESCRIPTION: _____

DRAWING NUMBER: 1216-73

DIMENSIONS:

		<u>FULL-SCALE</u> <u>FT/FT²</u>	<u>MODEL SCALE</u> <u>IN/IN²</u>
Length		<u>152</u>	<u>6.14</u>
Max. Width		<u>33.075</u>	<u>1.336</u>
Max. Depth	DIA.	<u> </u>	<u> </u>
Fineness Ratio		<u>4.59/1</u>	<u>4.59/1</u>
Area			
Max. Cross-Sectional		<u>858.75</u>	<u>1.401</u>
Planform		<u> </u>	<u> </u>
Wetted		<u> </u>	<u> </u>
Base		<u>955</u>	<u>1.55</u>

TABLE III. (CONTINUED)

MODEL COMPONENT: BODY - B₆ CYLINDRICAL BODY WITH A HEMISPHERIC NOSEGENERAL DESCRIPTION: _____

_____DRAWING NUMBER: 1216-54DIMENSIONS:

		<u>FULL-SCALE</u> <u>FT/FT²</u>	<u>MODEL SCALE</u> <u>IN/IN²</u>
Length		<u>141.44</u>	<u>5.713</u>
Max. Width	DIA.	<u>33.075</u>	<u>1.336</u>
Max. Depth		<u> </u>	<u> </u>
Fineness Ratio		<u>4.28/1</u>	<u>4.28/1</u>
Area			
Max. Cross-Sectional		<u>858.75</u>	<u>1.401</u>
Planform		<u> </u>	<u> </u>
Wetted		<u> </u>	<u> </u>
Base		<u>955</u>	<u>1.55</u>

TABLE III. (CONTINUED)

MODEL COMPONENT: WING - W11^AGENERAL DESCRIPTION: 0.003366 Scale Clipped Delta WingDRAWING NUMBER: 1216-27

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
	<u>FT²/FT</u>	<u>IN²/IN</u>
<u>TOTAL DATA</u>		
Area		
Planform	9000	14.6835
Wetted		
Span (equivalent)	140	5.668
Aspect Ratio	2.177	
Rate of Taper		
Taper Ratio		
Diehedral Angle, degrees	5°	5°
Incidence Angle, degrees	2°	2°
Aerodynamic Twist, degrees	0	0
Toe-In Angle		
Cant Angle		
Sweep Back Angles, degrees		
Leading Edge	51°30'	51°30'
Trailing Edge	5°30'	5°30'
0.25 Element Line		
Chords:		
Root (Wing Sta. 0.0)	111.6	4.508
Tip, (equivalent)	17.0	0.687
MAC		
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		
Airfoil Section		
Root		
Tip		
<u>EXPOSED DATA</u>		
Area		
Span, (equivalent)		
Aspect Ratio		
Taper Ratio		
Chords		
Root	89.2	3.606
Tip	17.0	0.687
MAC		
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		

TABLE III. (CONTINUED)

MODEL COMPONENT: VERTICAL STABILIZER - V₅^AGENERAL DESCRIPTION: 0.005366 Scale Tail with a 45° Leading Edge Sweep,
Mounted on the Centerline of the BoosterDRAWING NUMBER: 1216-30

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u> <u>FT²/FT</u>	<u>MODEL SCALE</u> <u>IN²/IN</u>
Area	<u>1500</u>	<u>2.447</u>
Span (equivalent)	<u>47.29</u>	<u>1.91</u>
Inb'd equivalent chord	<u>42.21</u>	<u>1.705</u>
Outb'd equivalent chord	<u>20.72</u>	<u>0.837</u>
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	<u> </u>	<u> </u>
At Outb'd equiv. chord	<u> </u>	<u> </u>
Sweep Back Angles, degrees		
Leading Edge	<u>45°52'</u>	<u>45°52'</u>
Tailing Edge	<u>59°54'</u>	<u>59°54'</u>
Hingeline	<u> </u>	<u> </u>
Area Moment (Normal to hinge line)	<u> </u>	<u> </u>

TABLE III. (CONTINUED)

MODEL COMPONENT: V₇ VERTICAL STABILIZER

GENERAL DESCRIPTION: _____

DRAWING NUMBER: 1216-56

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u> <u>FT/FT²</u>	<u>MODEL SCALE</u> <u>IN/IN²</u>
Area	<u>1500</u>	<u>2.447</u>
Span (equivalent)	<u>54.94</u>	<u>2.219</u>
Inb'd equivalent chord	<u>43.821</u>	<u>1.77</u>
Outb'd equivalent chord	<u>10.82</u>	<u>0.437</u>
Taper Ratio	<u>.25</u>	<u>.25</u>
Aspect Ratio	<u>2.0</u>	<u>2.0</u>
Sweep Back Angles, degrees		
Leading Edge	<u>43°30'</u>	<u>43°30'</u>
Tailing Edge	<u>18°45'</u>	<u>18°45'</u>
Hingeline	<u> </u>	<u> </u>
Area Moment (Normal to hinge line)	<u> </u>	<u> </u>

TABLE III. (CONTINUED)

MODEL COMPONENT: V₈ VERTICAL STABILIZERGENERAL DESCRIPTION: _____

_____DRAWING NUMBER: 1216-57DIMENSIONS:

	<u>FULL-SCALE</u> <u>FT/FT²</u>	<u>MODEL SCALE</u> <u>IN/IN²</u>
Area	<u>2000</u>	<u>3.264</u>
Span (equivalent)	<u>63.55</u>	<u>2.567</u>
Inb'd equivalent chord	<u>50.6</u>	<u>2.044</u>
Outb'd equivalent chord	<u>12.38</u>	<u>0.5</u>
Taper Ratio	<u>.25</u>	<u>.25</u>
Aspect Ratio	<u>2.0</u>	<u>2.0</u>
Sweep Back Angles, degrees		
Leading Edge	<u>43°30'</u>	<u>43°30'</u>
Tailing Edge	<u>18°50'</u>	<u>18°50'</u>
Hingeline	_____	_____
Area Moment (Normal to hinge line)	_____	_____

TABLE III. (CONTINUED)

MODEL COMPONENT: V₉ VEE TAIL STABILIZERGENERAL DESCRIPTION: VERTICAL TAIL ROLLED 30° FROM THE VERTICAL (TWO)DRAWING NUMBER: 1216-61

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u> <u>FT/FT²</u>	<u>MODEL SCALE</u> <u>IN/IN²</u>
Area	<u>750 ea.</u>	<u>1.223 ea.</u>
Span (equivalent)	<u>38.72</u>	<u>1.564</u>
Inb'd equivalent chord	<u>30.97</u>	<u>1.251</u>
Outb'd equivalent chord	<u>7.5</u>	<u>.303</u>
Taper Ratio	<u>.25</u>	<u>.25</u>
Aspect Ratio	<u>2.0</u>	<u>2.0</u>
Sweep Back Angles, degrees		
Leading Edge	<u>43°30'</u>	<u>43°30'</u>
Tailing Edge	<u>18°50'</u>	<u>18°50'</u>
Hinge line	<u> </u>	<u> </u>
Area Moment (Normal to hinge line)	<u> </u>	<u> </u>

TABLE III. (CONTINUED)

MODEL COMPONENT: V10 TWIN VENTRALSGENERAL DESCRIPTION: FOLD DOWN FLAP - SPLITDRAWING NUMBER: 1216-75DIMENSIONS:

	<u>FULL-SCALE</u> <u>FT/FT²</u>	<u>MODEL SCALE</u> <u>IN/IN²</u>
Area	<u>220 ea.</u>	<u>.335 ea.</u>
Span (equivalent)	<u>16.09</u>	<u>.65</u>
Inb'd equivalent chord	<u>12.379</u>	<u>.50</u>
Outb'd equivalent chord	<u>12.379</u>	<u>.50</u>
Taper Ratio	<u>1.0</u>	<u>1.0</u>
Aspect Ratio	<u>1.34</u>	<u>1.34</u>
Sweep Back Angles, degrees		
Leading Edge	<u>0°</u>	<u>0°</u>
Tailing Edge	<u>0°</u>	<u>0°</u>
Hingeline	<u></u>	<u></u>
Area Moment (Normal to hinge line)	<u></u>	<u></u>

TABLE III. (CONTINUED)

MODEL COMPONENT: E2 - PROPULSION PODGENERAL DESCRIPTION: 0.003366 SCALE AIRBREATHING ENGINE POD MOUNTED
UNDER THE WINGDRAWING NUMBER: _____DIMENSIONS:

	<u>FULL-SCALE</u> <u>FT</u>	<u>MODEL SCALE</u> <u>IN</u>
Length	<u>42.46</u>	<u>1.715</u>
Inlet Width MS 3.994	<u>31.81</u>	<u>1.285</u>
Exit Width	<u>45.04</u>	<u>1.819</u>
Max. Width	<u>48.89</u>	<u>1.975</u>
Area		
Max. Cross-Sectional	<u> </u>	<u> </u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u> </u>	<u> </u>

TABLE III. (CONTINUED)

MODEL COMPONENT: E₃ - NOSE PROPULSION PODSGENERAL DESCRIPTION: _____

_____DRAWING NUMBER: 1216-63DIMENSIONS:

	<u>FULL-SCALE</u> <u>FT</u>	<u>MODEL SCALE</u> <u>IN</u>
Length	<u>31.05</u>	<u>1.254</u>
Max. Width (Overall)	<u>41.81</u>	<u>1.689</u>
Max. Width	<u>27.9</u>	<u>1.125</u>
Fineness Ratio	<u> </u>	<u> </u>
Area		
max. Cross-Sectional	<u> </u>	<u> </u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u> </u>	<u> </u>
Inlet Width (MS 1.144)	<u>18.72</u>	<u>0.756</u>
Exit Width	<u>27.23</u>	<u>1.100</u>

TABLE III. (CONTINUED)

MODEL COMPONENT: E₄ - PROPULSION PODS

GENERAL DESCRIPTION: 0.003366 SCALE AIRBREATHING ENGINE PODS MOUNTED
IN TWO LONGITUDINAL POSITIONS 34°30' OFF THE BODY CENTERLINE ON THE UPPER
PART OF THE BODY

DRAWING NUMBER: 1216-79

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u> FT	<u>MODEL SCALE</u> IN
Length	<u>22.38</u>	<u>0.904</u>
Exit Diameter	<u>2.48</u>	<u>0.10</u>
Max. Diameter	<u>5.94</u>	<u>0.24</u>
Fineness Ratio	<u> </u>	<u> </u>
Area		
Max. Cross-Sectional	<u> </u>	<u> </u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u> </u>	<u> </u>
Exit Plane	MS 3.772 FWD LOCATION MS 4.766 AFT LOCATION	

TABLE III. (CONTINUED)

MODEL COMPONENT: C3 CHINEGENERAL DESCRIPTION: FOREBODY CHINEDRAWING NUMBER: 1216-62DIMENSIONS:

	<u>FULL-SCALE</u> <u>FT/FT²</u>	<u>MODEL SCALE</u> <u>IN/IN²</u>
Length	<u>33.55</u>	<u>1.355</u>
Max. Width	<u> </u>	<u> </u>
Max. Depth	<u> </u>	<u> </u>
Fineness Ratio	<u> </u>	<u> </u>
Area		
Max. Cross-Sectional	<u> </u>	<u> </u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u> </u>	<u> </u>
Exposed Span	<u>2.3/side</u>	<u>0.093/side</u>
Aft of Sta. 2.15		
L.E. Sweep	<u>30°</u>	<u>30°</u>

TABLE III. (CONTINUED)

MODEL COMPONENT: C4 CHINEGENERAL DESCRIPTION: FOREBODY CHINEDRAWING NUMBER: 1216-62DIMENSIONS:

	<u>FULL-SCALE</u> <u>FT/FT²</u>	<u>MODEL SCALE</u> <u>IN/IN²</u>
Length	<u>19.80</u>	<u>0.80</u>
Max. Width	<u> </u>	<u> </u>
Max. Depth	<u> </u>	<u> </u>
Fineness Ratio	<u> </u>	<u> </u>
Area		
Max. Cross-Sectional	<u> </u>	<u> </u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u> </u>	<u> </u>
Exposed Span	<u>2.3/side</u>	<u>0.093/side</u>
Aft of Sta. 2.15		
L.E. Sweep	<u>30° 30'</u>	<u>30° 30'</u>

TABLE III. (CONTINUED)

MODEL COMPONENT: F₁ - BODY FLAP (FORE)

GENERAL DESCRIPTION: _____

DRAWING NUMBER: _____

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u> <u>FT/FT²</u>	<u>MODEL SCALE</u> <u>IN/IN²</u>
Area	_____	_____
Span (equivalent)	40.4	1.632
Inb'd equivalent chord	13.4	0.542
Outb'd equivalent chord	_____	_____
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	_____	_____
At Outb'd equiv. chord	_____	_____
Sweep Back Angles, degrees		
Leading Edge	_____	_____
Tailing Edge	0°	0°
Hingeline	0°	0°
Area Moment (Normal to hinge line)	_____	_____

TABLE III. (CONTINUED)

MODEL COMPONENT: F₂ - BODY FLAP (AFT)

GENERAL DESCRIPTION: _____

DRAWING NUMBER: 1216-20

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u> <u>FT/FT²</u>	<u>MODEL SCALE</u> <u>IN/IN²</u>
Area	_____	_____
Span (equivalent)	<u>40.4</u>	<u>1.632</u>
Inb'd equivalent chord	<u>13.4</u>	<u>0.542</u>
Outb'd equivalent chord	_____	_____
Ratio movable surface chord/ total surface chord	_____	_____
At Inb'd equiv. chord	_____	_____
At Outb'd equiv. chord	_____	_____
Sweep Back Angles, degrees	_____	_____
Leading Edge	_____	_____
Tailing Edge	<u>0°</u>	<u>0°</u>
Hingeline	<u>0°</u>	<u>0°</u>
Area Moment (Normal to hinge line)	_____	_____

TABLE III. (CONCLUDED)

MODEL COMPONENT: S₁ - ROCKET ENGINE SHROUDS (2)

GENERAL DESCRIPTION: _____

DRAWING NUMBER: 1216-18/71

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u> FT	<u>MODEL SCALE</u> IN
Area	_____	_____
Length (Equivalent)	<u>31.98</u>	<u>1.292</u>
Maximum Diameter	<u>13.7</u>	<u>0.556</u>
Outb'd equivalent chord	_____	_____
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	_____	_____
At Outb'd equiv. chord	_____	_____
Sweep Back Angles, degrees		
Leading Edge	_____	_____
Tailing Edge	_____	_____
Hingeline	_____	_____
Area Moment (Normal to hinge line)	_____	_____

TABLE IV
INDEX OF MODEL FIGURES

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TABLE V. INDEX TO DATA FIGURES

TITLE	PLOTTED COEFFICIENTS SCHEDULE*		CONDITIONS VARYING	PAGES
Longitudinal Stability	A		Mach, Configuration	1-115
Lateral Stability	B		Mach, Configuration	116-271

* PLOTTED COEFFICIENTS SCHEDULE:

- (A) C_N , C_L , C_{IM} , C_{AT} , C_{AF} , DC_{IMCN} , $CPB(AVG)$ vs. Alpha & C_L vs. C_{IM} & C_L vs. C_{DF}
- (B) C_Y , C_{YN} , C_{BL} , C_L , C_{DF} , C_{AF} , C_{IM} , DC_{INCY} vs. Beta

MODEL FIGURES

- Notes:
1. Positive directions of force coefficients moment coefficients, and angles are indicated by arrows.
 2. For clarity, origins of wind and stability axes have been displaced from the center of gravity.

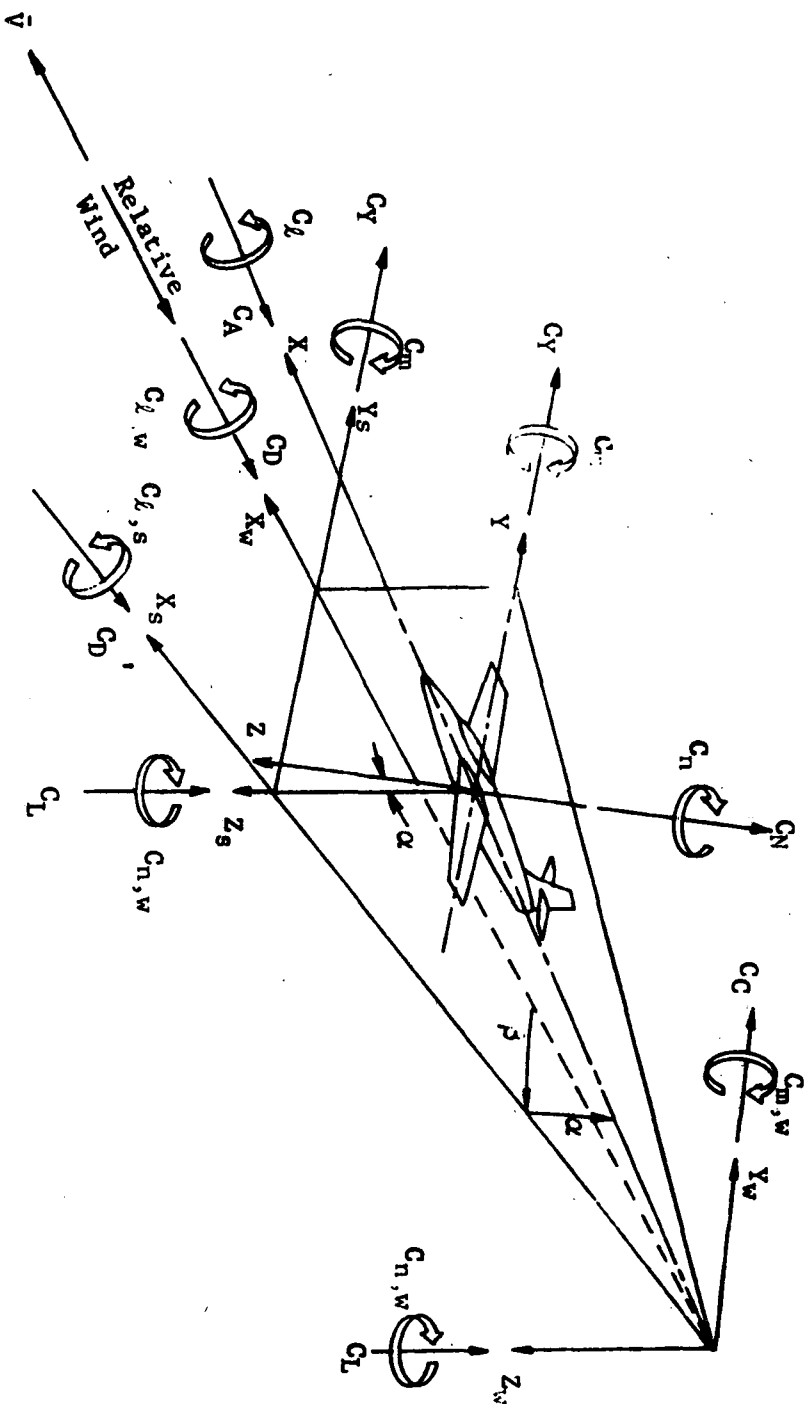
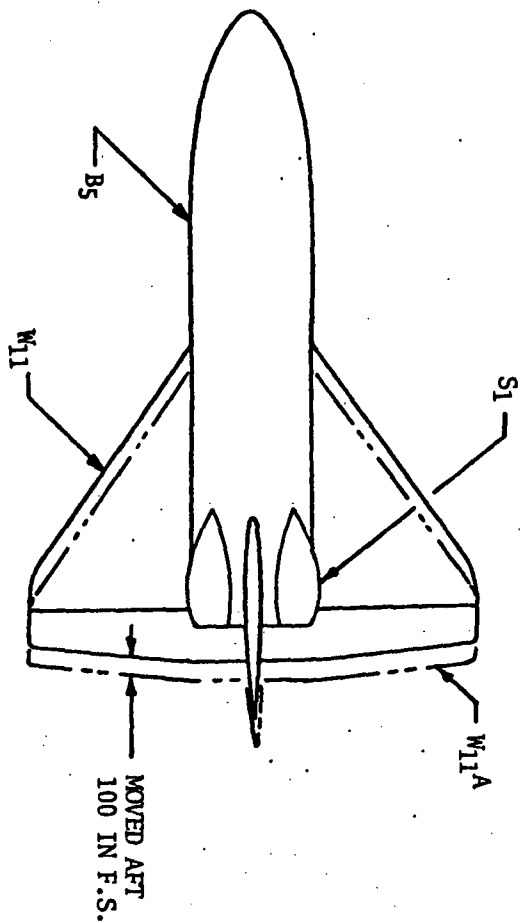


Figure 1. Axis systems, showing direction and sense of force and moment coefficients, angle of attack, and sideslip angle



$S = 14.6836 \text{ sq.in. (9000 sq.ft.) } [W_{11}]$
 $l_{LONG} = 4.508 \text{ in.}$
 $l_{LAT} = 5.655$
 $AR = 2.18$
 $\lambda = 0.15$
 $i_w = +2^\circ$

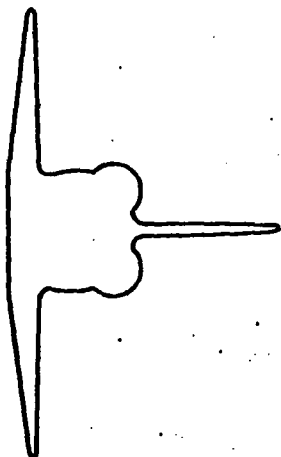
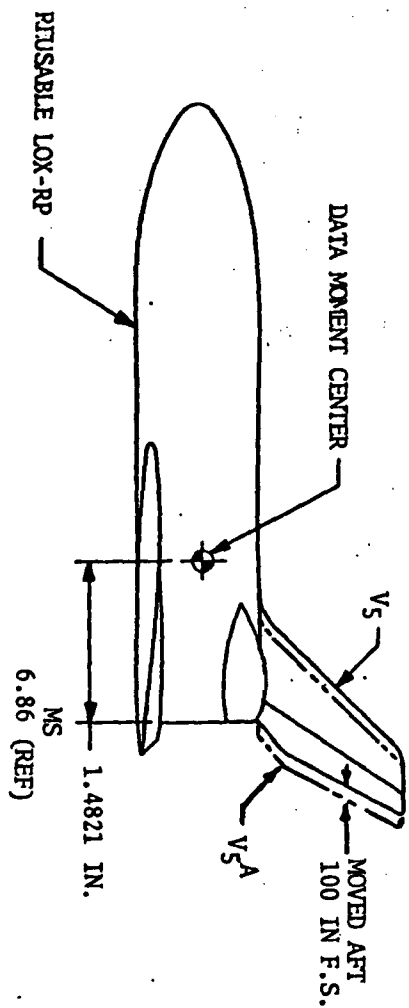


FIGURE 2. REUSABLE LOX-RP (-061) BOOSTER
 0.00366 SCALE AR 12161-2 MODEL

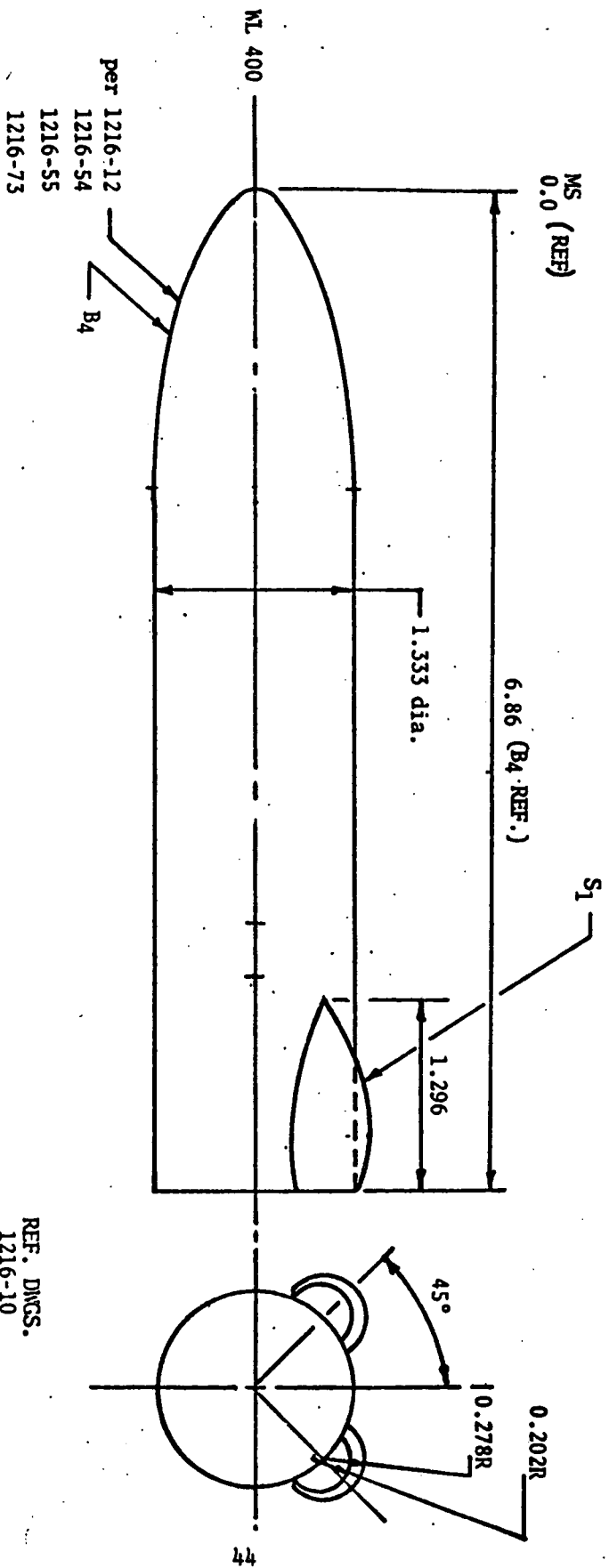


FIGURE 3. REUSABLE LOX-RP (-061) BOOSTER BODY
0.003366 SCALE AR 12161-2 MODEL

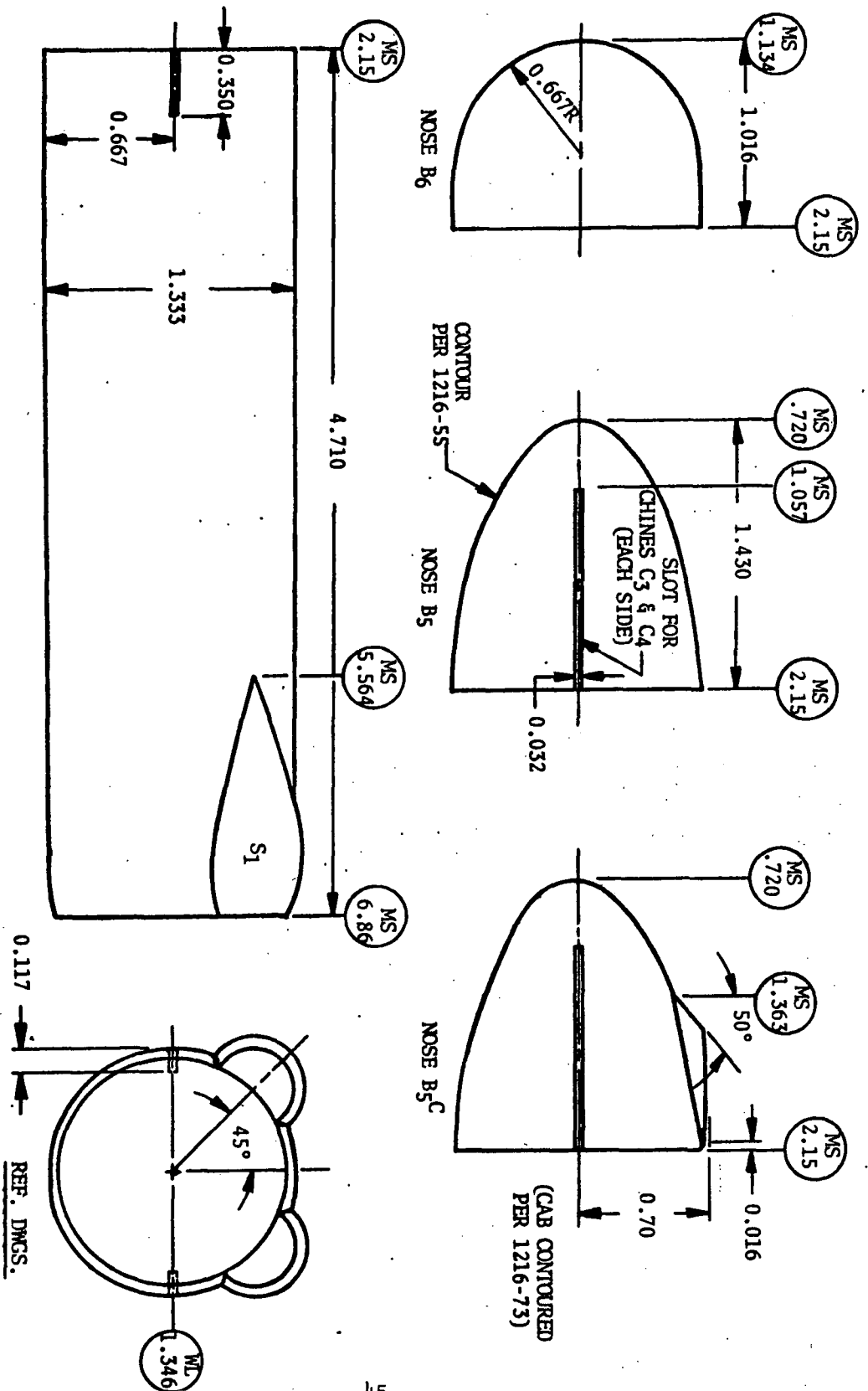
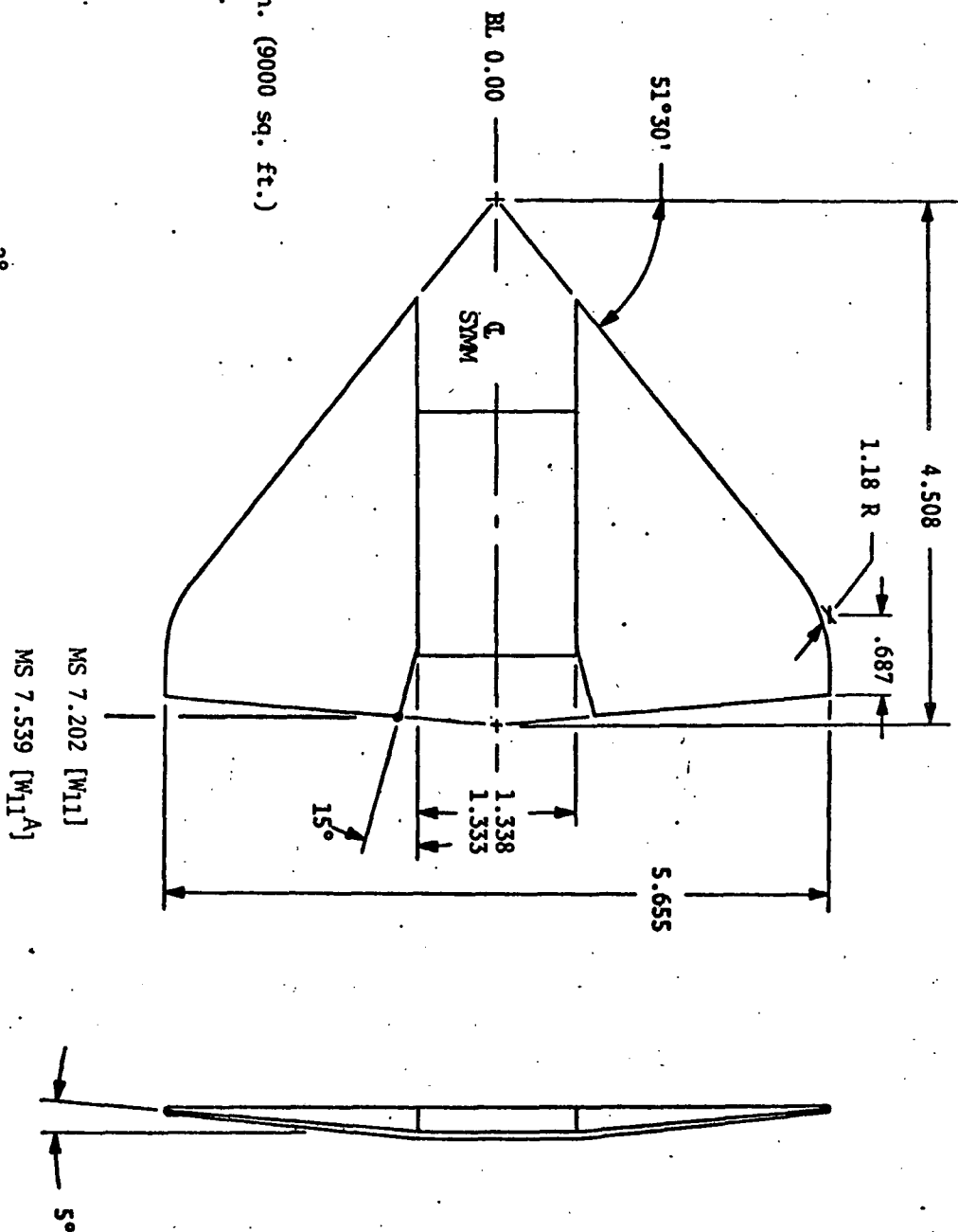


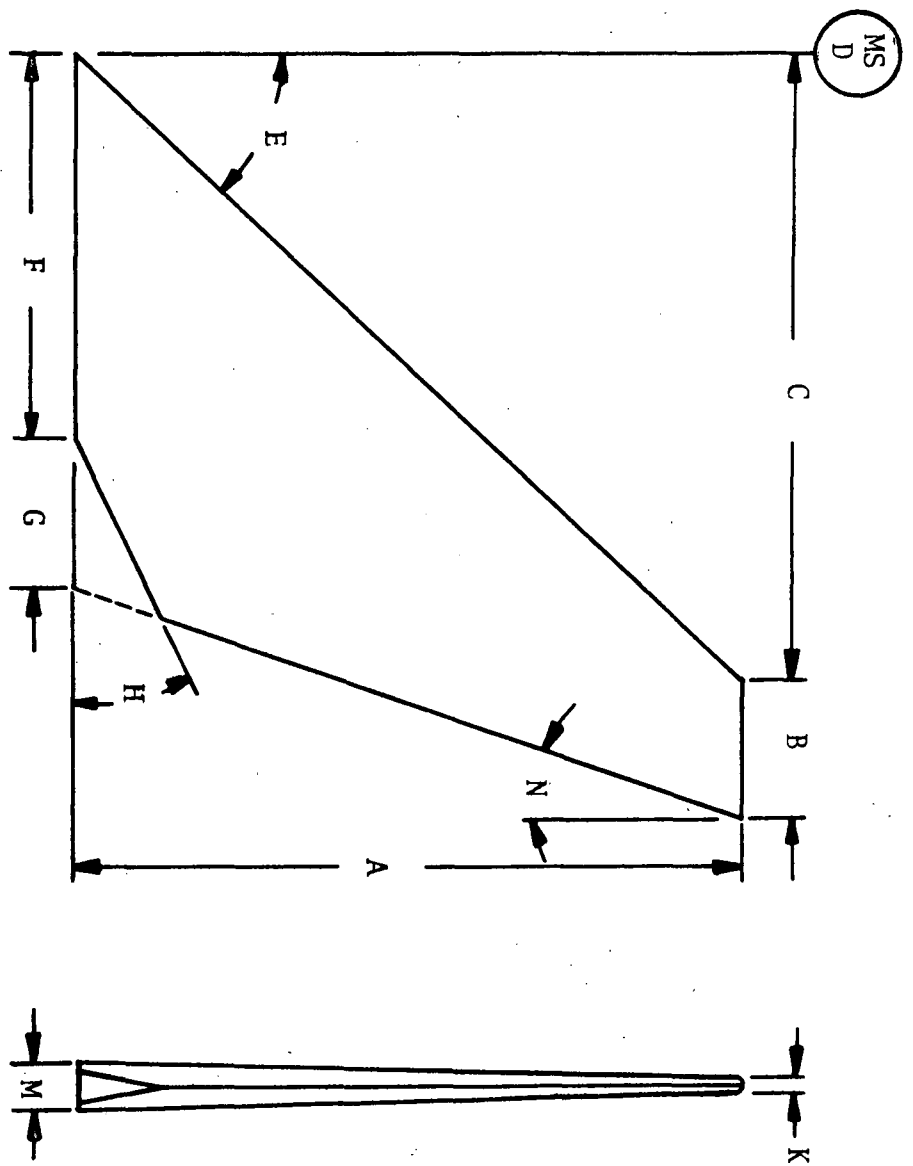
FIGURE 4. BODY B5, B6 AND B5C
0.003366 SCALE AR 12161-2

MS 3.091 (W_{11}^A)
MS 2.754 (W_{11})



$S = 14.6836$ sq.in. (9000 sq. ft.)
 $l_{LONG} = 4.508$ in.
 $l_{LAT} = 5.655$ in.
 $AR = 2.18$
 $\lambda = 0.15$

FIGURE 5. REUSABLE LOX-RP (-061) BOOSTER WING - W_{11}
0.003366 SCALE AR 12161-2 MODEL



DIMEN.	VERTICAL TAIL		
	V5	V7	V8
A	1.917"	2.212"	2.555"
B	0.854"	0.442"	0.511"
C	1.917"	2.085"	2.408"
D	5.746	5.681	5.407
E	45°	43°18'	43°18'
F	1.505"	1.179"	1.453"
G	0.20"	0.591"	0.591"
H	45°	25°	25°
K	-	0.035"	0.040"
M	0.125"	0.143"	0.165"
N	31°	18°54'	18°54'

FIGURE 6. VERTICAL TAILS V5, V7 AND V8
0.003366 SCALE AR 12161-2

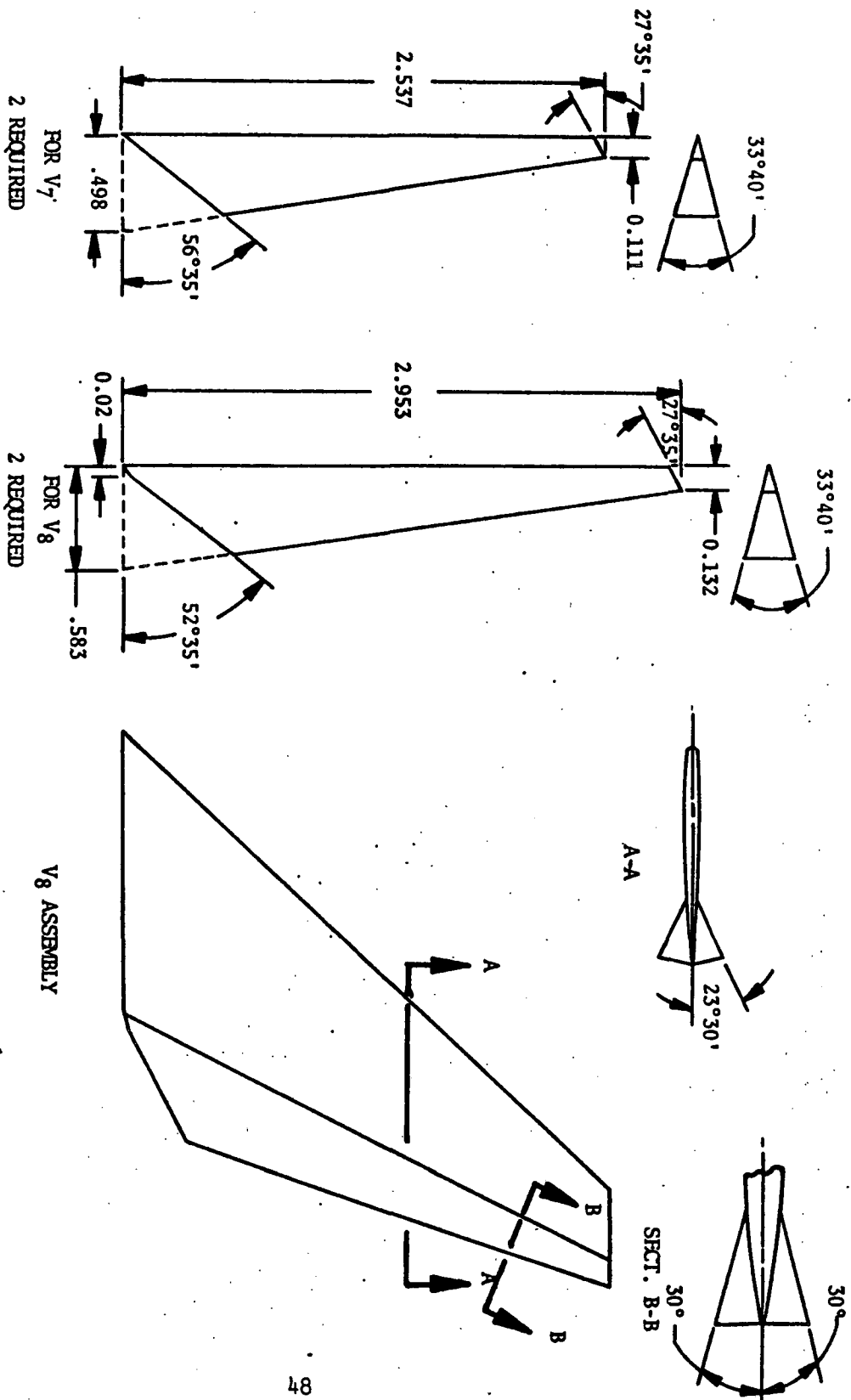
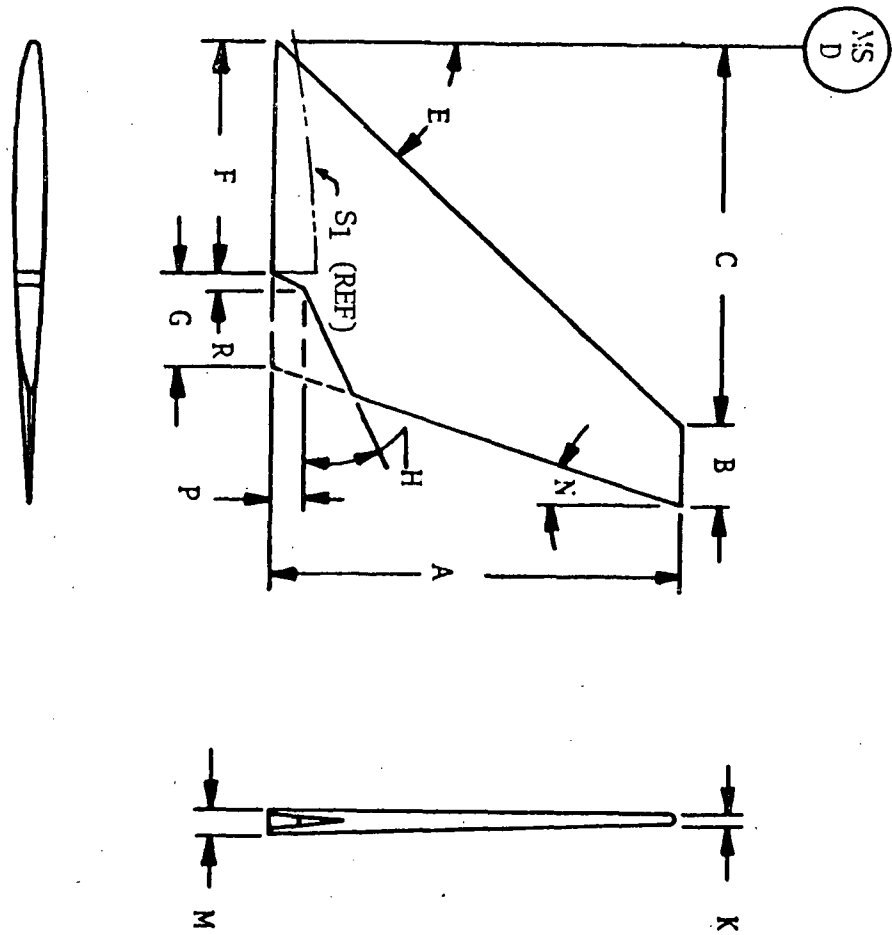


FIGURE 7. SPLIT RUDDERS - V7 AND V8
0.003566 SCALE AR 12161-2



DIMEN.	VERTICAL TAIL	
	Vg*	
A	1.564"	
B	0.313"	
C	1.474"	
D	5.969	
E	43°18'	
F	0.891"	
G	0.360"	
H	25°	
K	0.025"	
M	0.100"	
N	18°54'	
P	0.108"	
R	0.059"	

*NOTE: TWO REQUIRED TO BE LOCATED *30° OFF VERTICAL.

FIGURE 8. VERTICAL TAIL Vg
0.003366 SCALE AR 12161-2

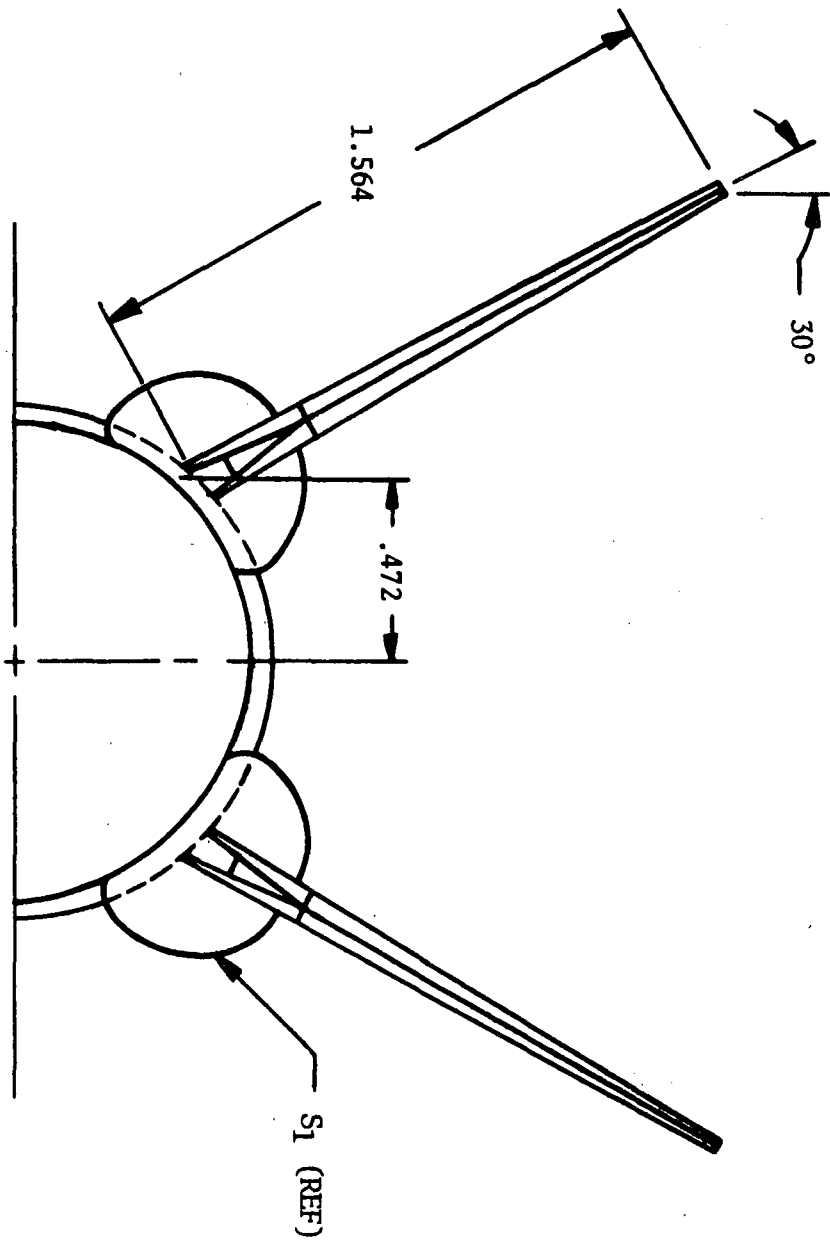


FIGURE 9. VERTICAL V_g ASSEMBLY
0.003366 SCALE AR 12161-2

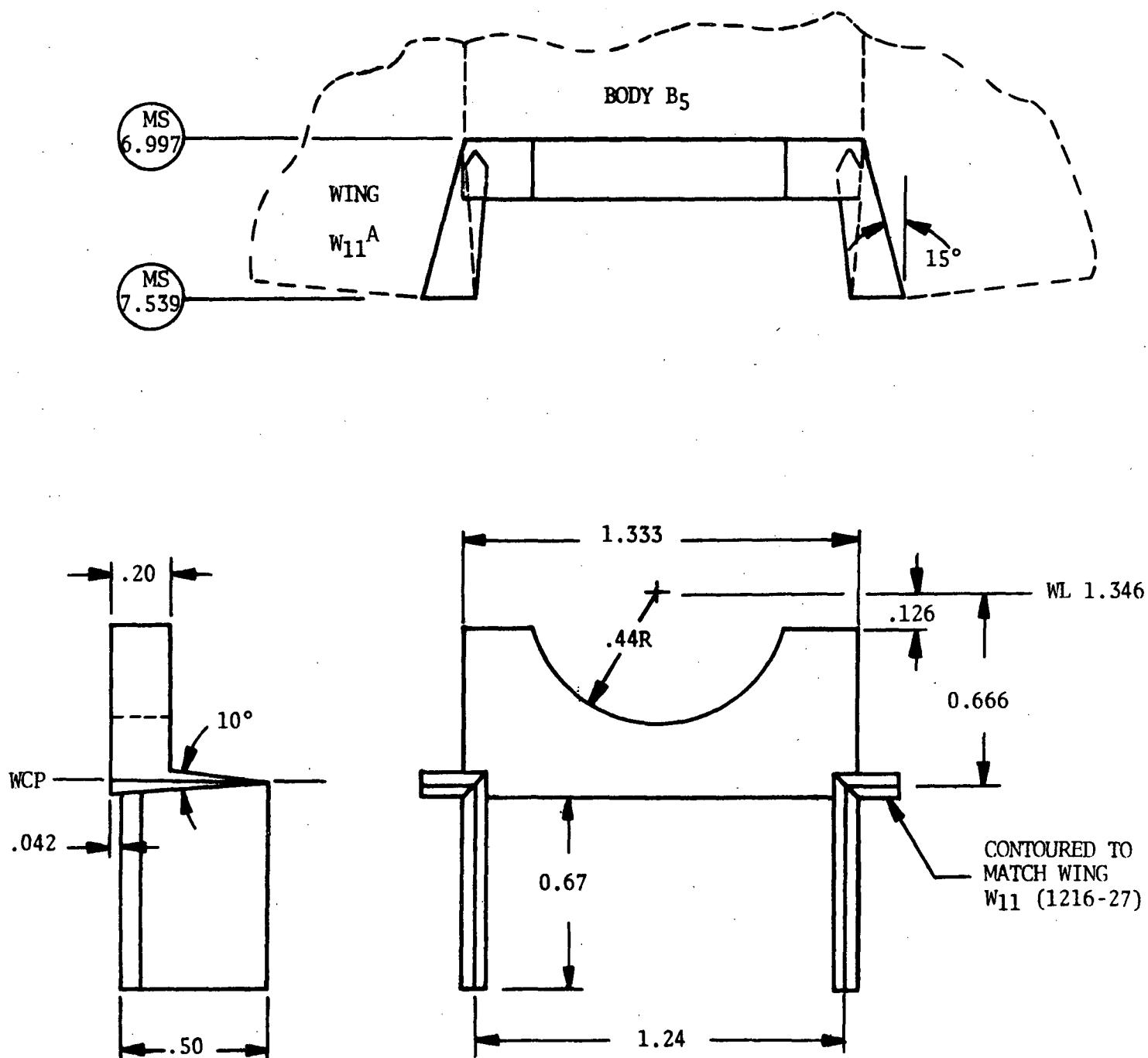
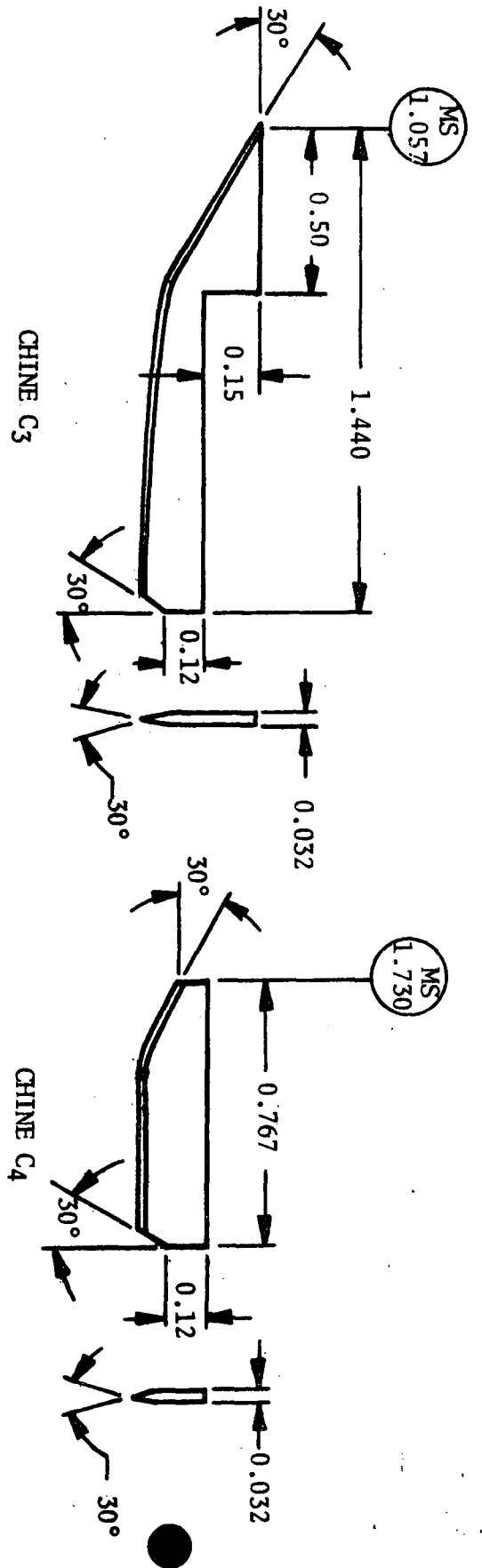


FIGURE 10. VENTRALS V₁₀
0.003366 SCALE AR 1216I-2



REF. 1216-62 FOR LOWER CONTOURS

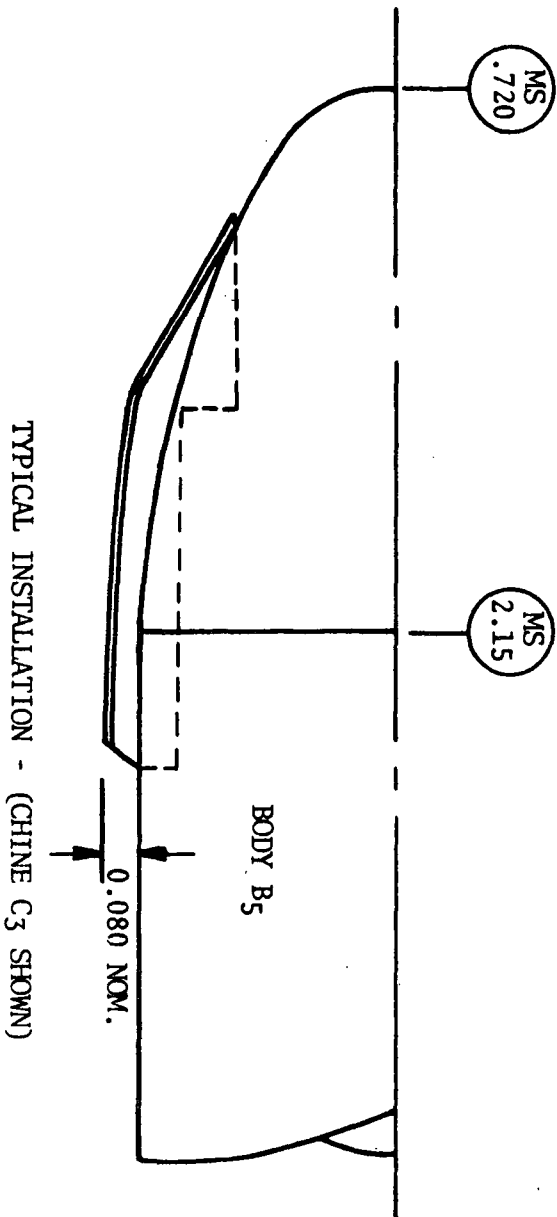


FIGURE 11. CHINES C3 AND C4

0.003366 SCALE AR 12161-2

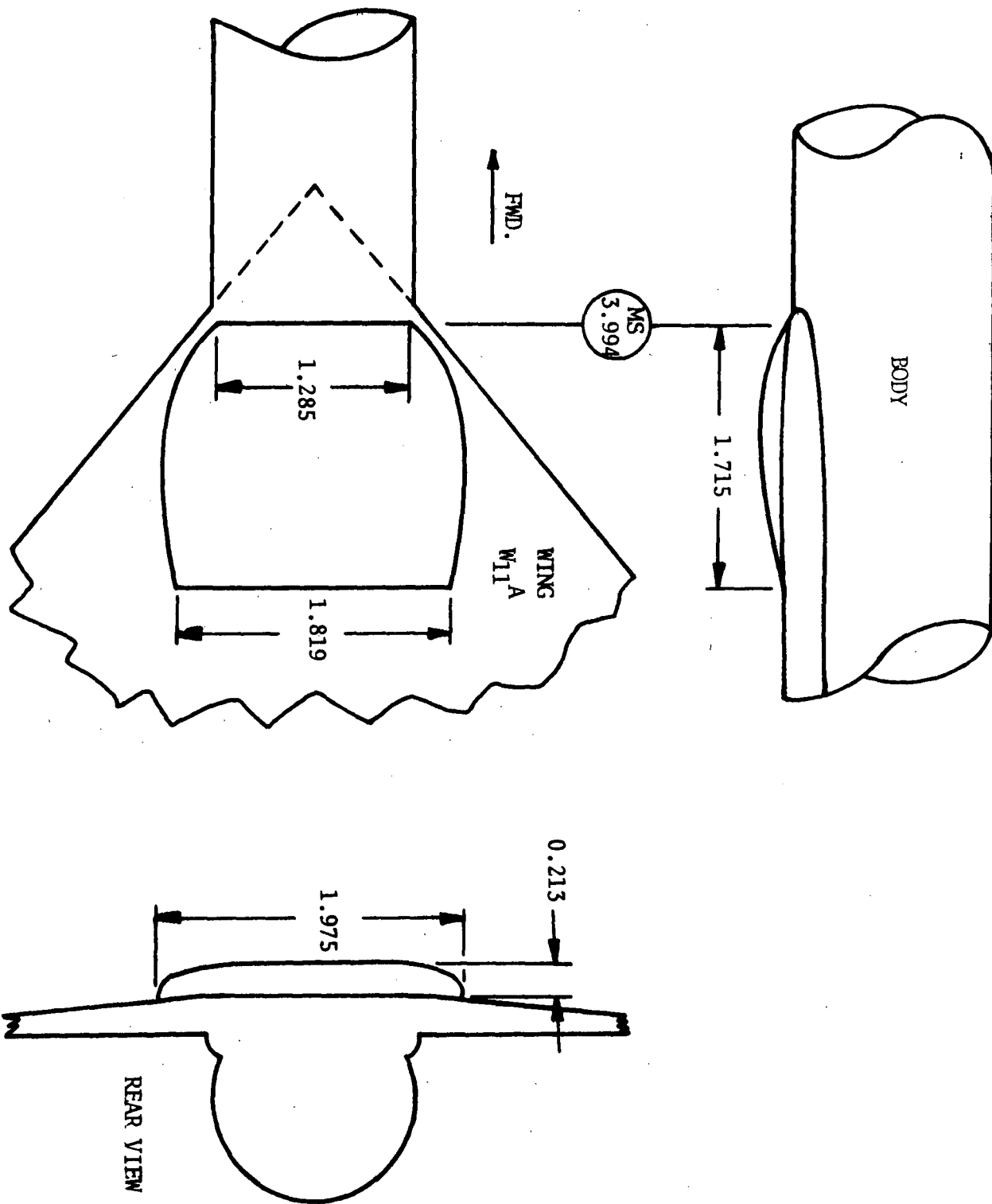
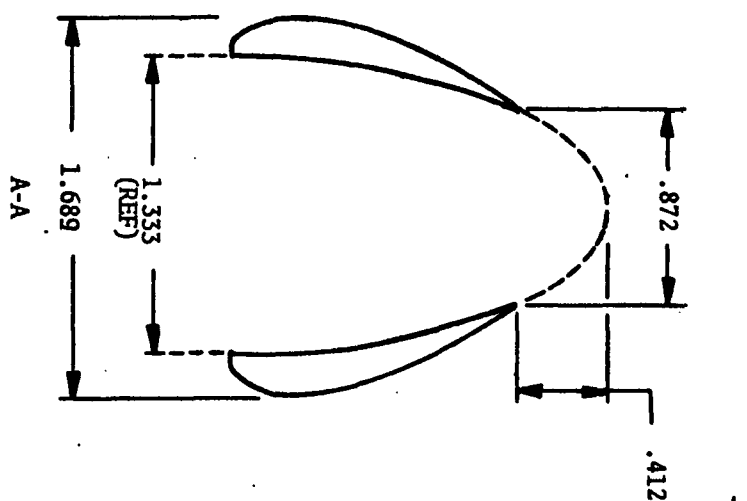
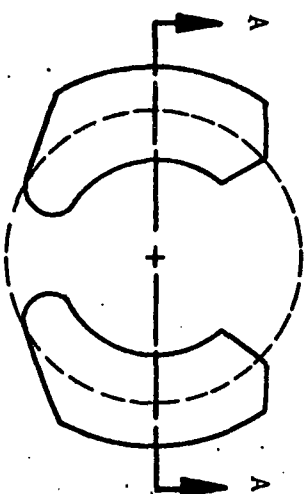


FIGURE 12. ENGINE POD E2
0.003366 SCALE MODEL AR 12161-2



----- DENOTES BODY B₅



REF. DMC. 1216-63 FOR CONTOURS

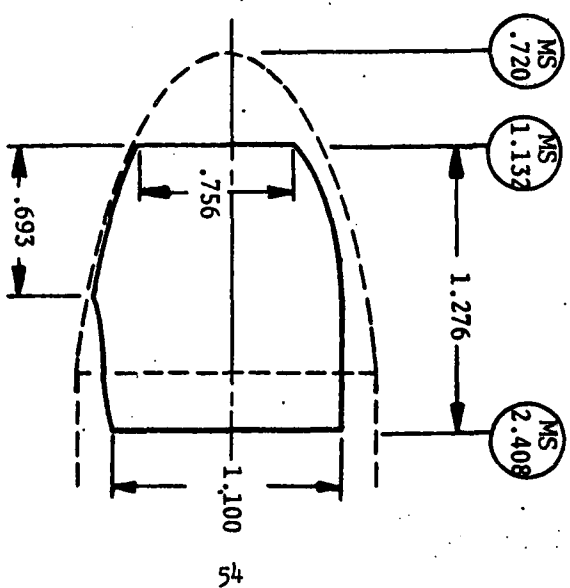


FIGURE 13. ENGINE POD E₃
0.003566 SCALE AR 12161-2

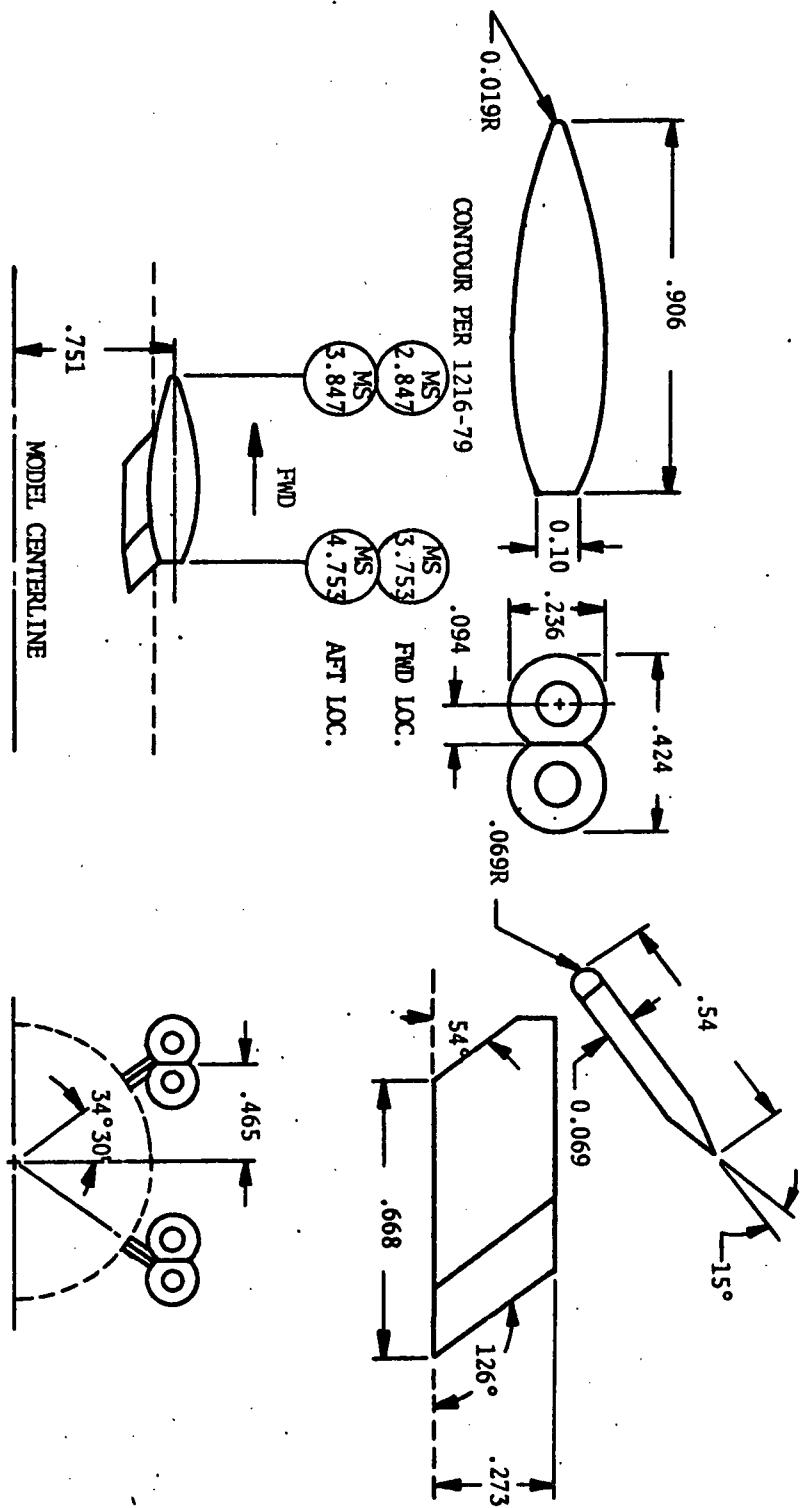
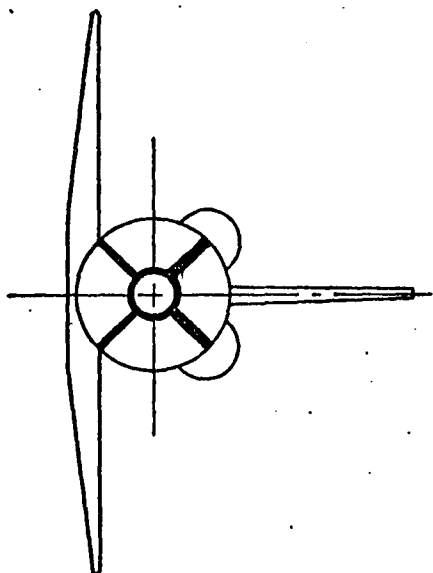


FIGURE 14. ENGINE PODS E4
0.003366 SCALE AR 12161-2

NOTE: TWO DIFFERENT
SCALES SHOWN
REF. DWG. 1216-79

USE GRIT #180



ALL TRIP STRIP WIDTHS = 0.06 TO 0.08

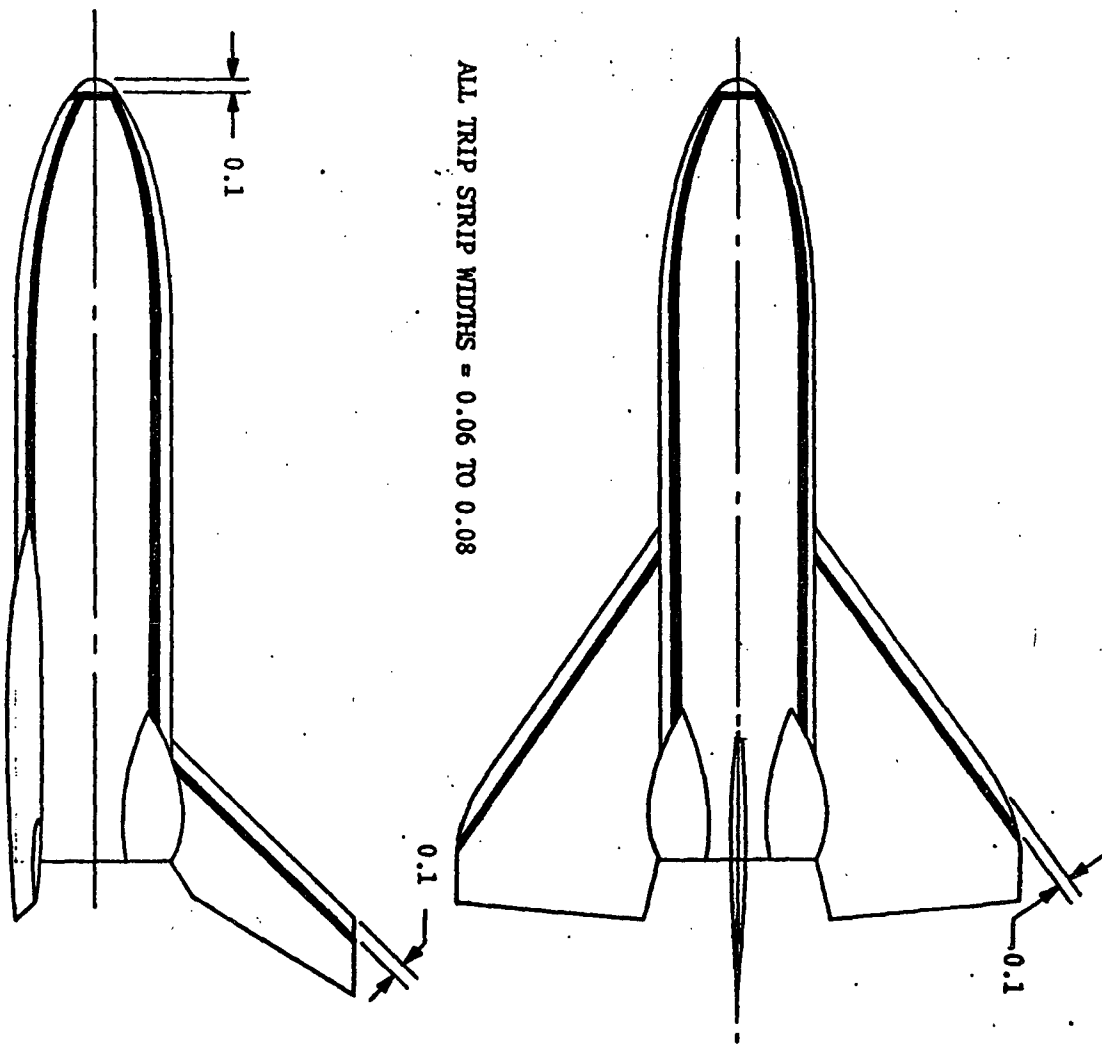
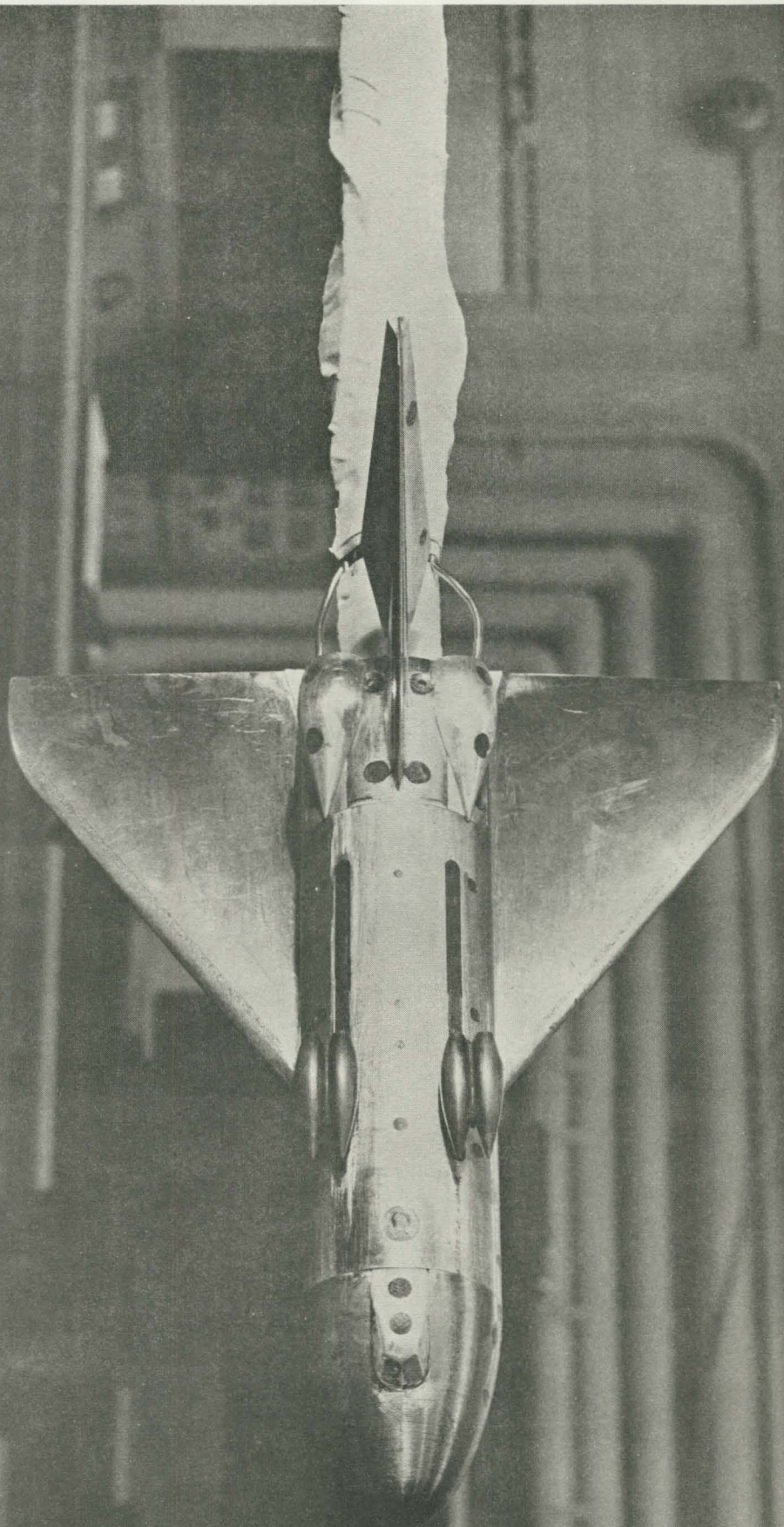


FIGURE 15. TRIP STRIP CHART
AR12161-2 MODEL

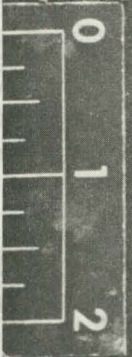


MSFC TWT 513

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CONFIC

CAFSVE
BWFSVE
5112174



NASA-MSFC
S&E-Aero-AE

Figure 16. Top View-Booster Model with Engine Pods

Figure 17. Tunnel Installation of Booster Model

12-06-71

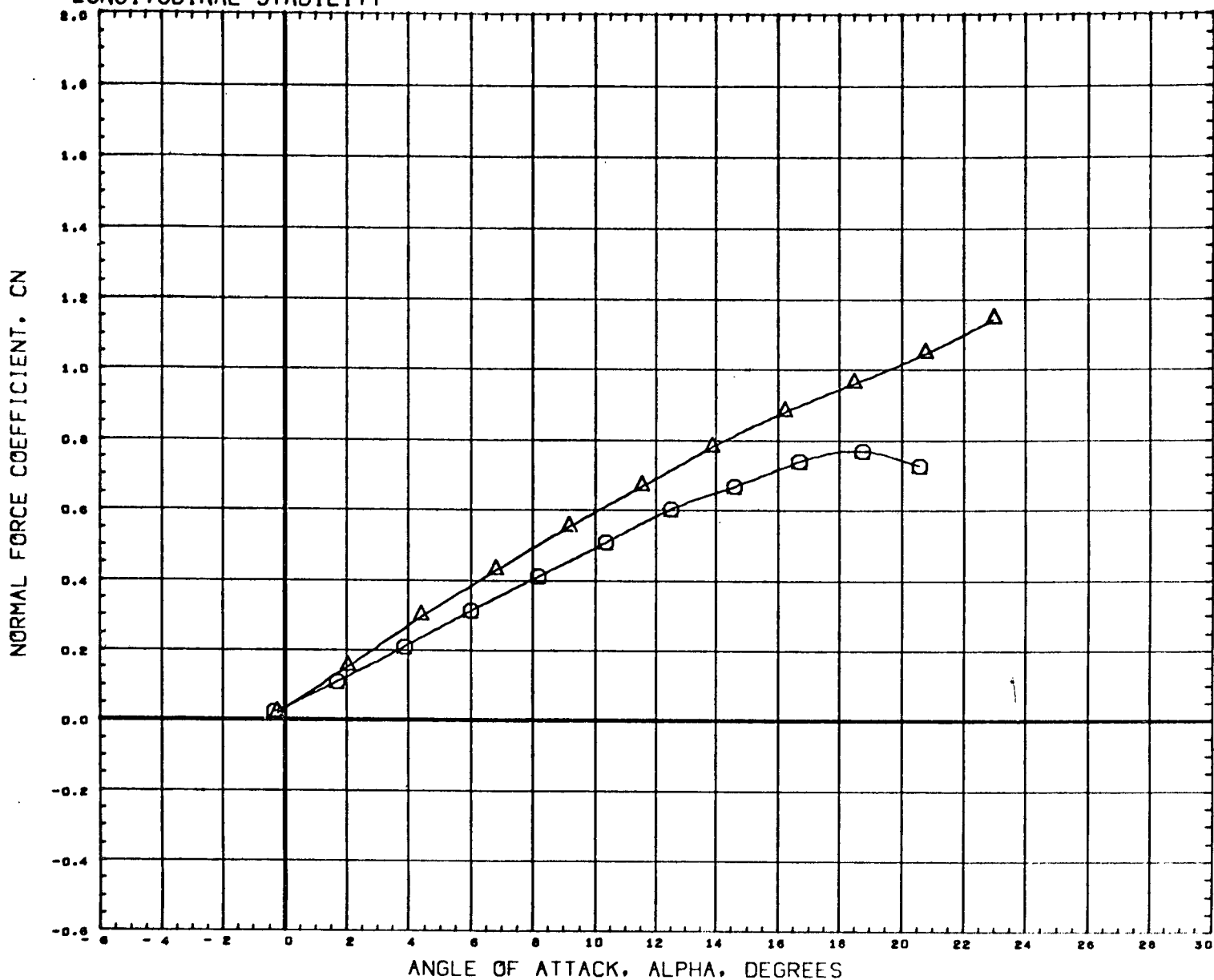
191-1-71



P L O T T E D D A T A

Tabulations of the plotted data and corresponding
source data are available from SADSAC Operations.

LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	0.597	BETA	0.000	RUDDER	0.000
△	1.204	RUDFLR	0.000		

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BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
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DATA HIST. CODE GC

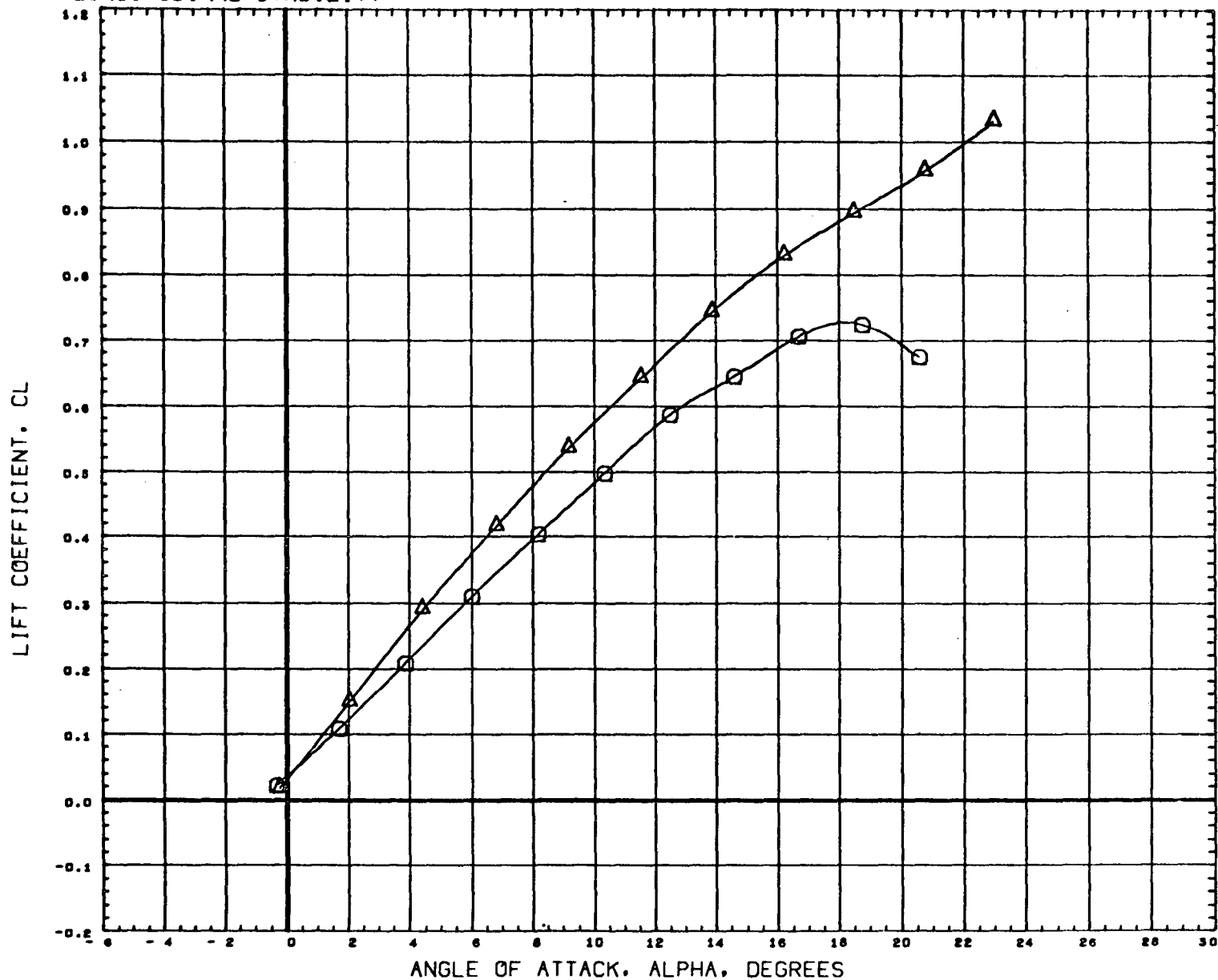
M513-MSFC MODELAR12161-2

B4W11F1S1V5A

(C5325A) 18 MAR 72

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LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
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△	1.204	RUDFLR	0.000	0.000

REFERENCE INFORMATION		
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LREF	4.5080	in.
BREF	5.6550	in.
XMRP	1.4821	in.
YMRP	0.0000	in.
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DATA HIST. CODE GC

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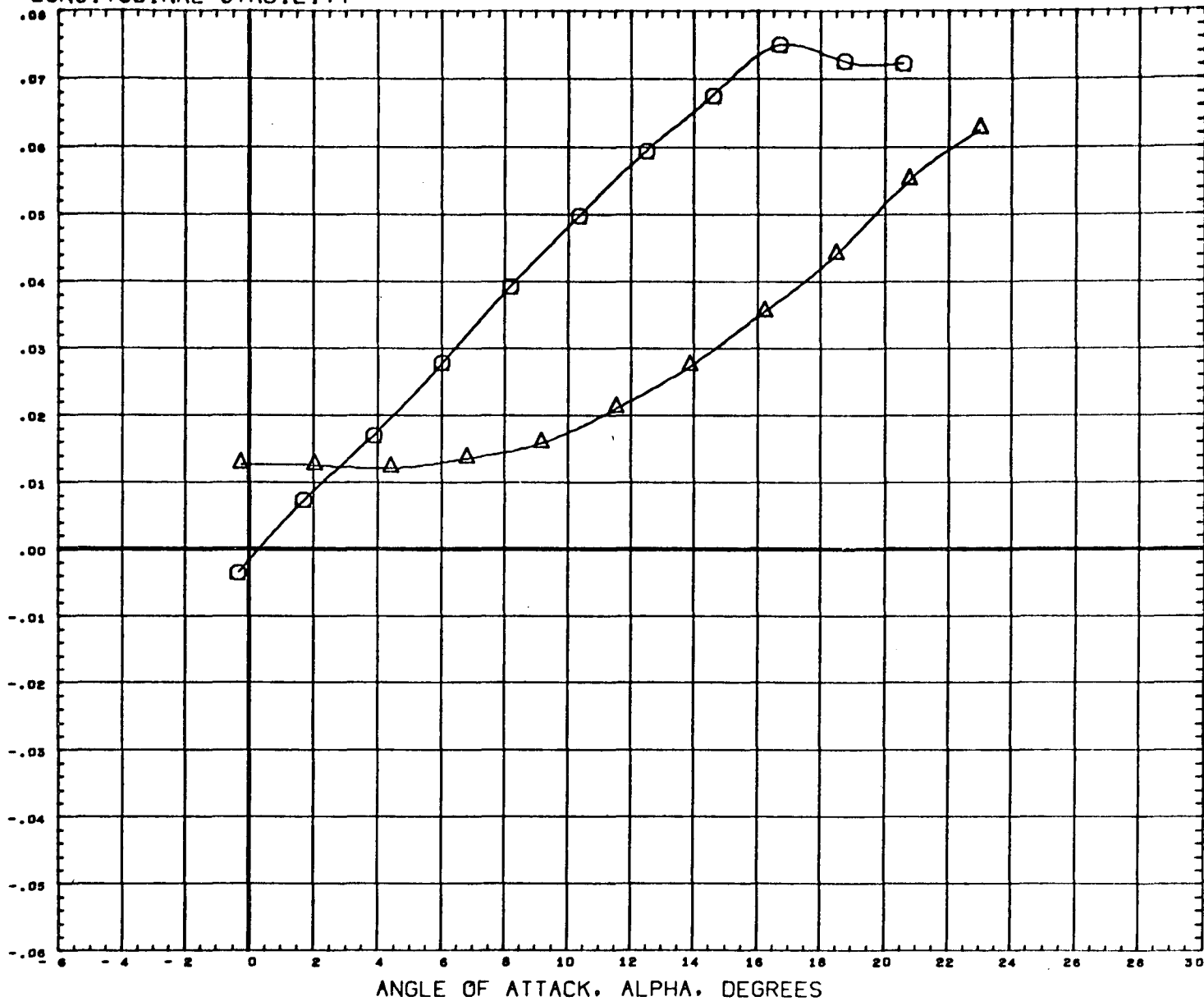
(C5325A) 18 MAR 72

PAGE

2

LONGITUDINAL STABILITY

PITCHING MOMENT COEFFICIENT, CLM



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△	1.204	RUDFLR	0.000		

REFERENCE INFORMATION		
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BREF	5.6550	in.
XMRF	1.4821	in.
YMRF	0.0000	in.
ZMRF	0.0000	in.
SCALE	0.0034	

DATA HIST. CODE GC

M513-MSFC MODELAR12161-2

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(C5325A)

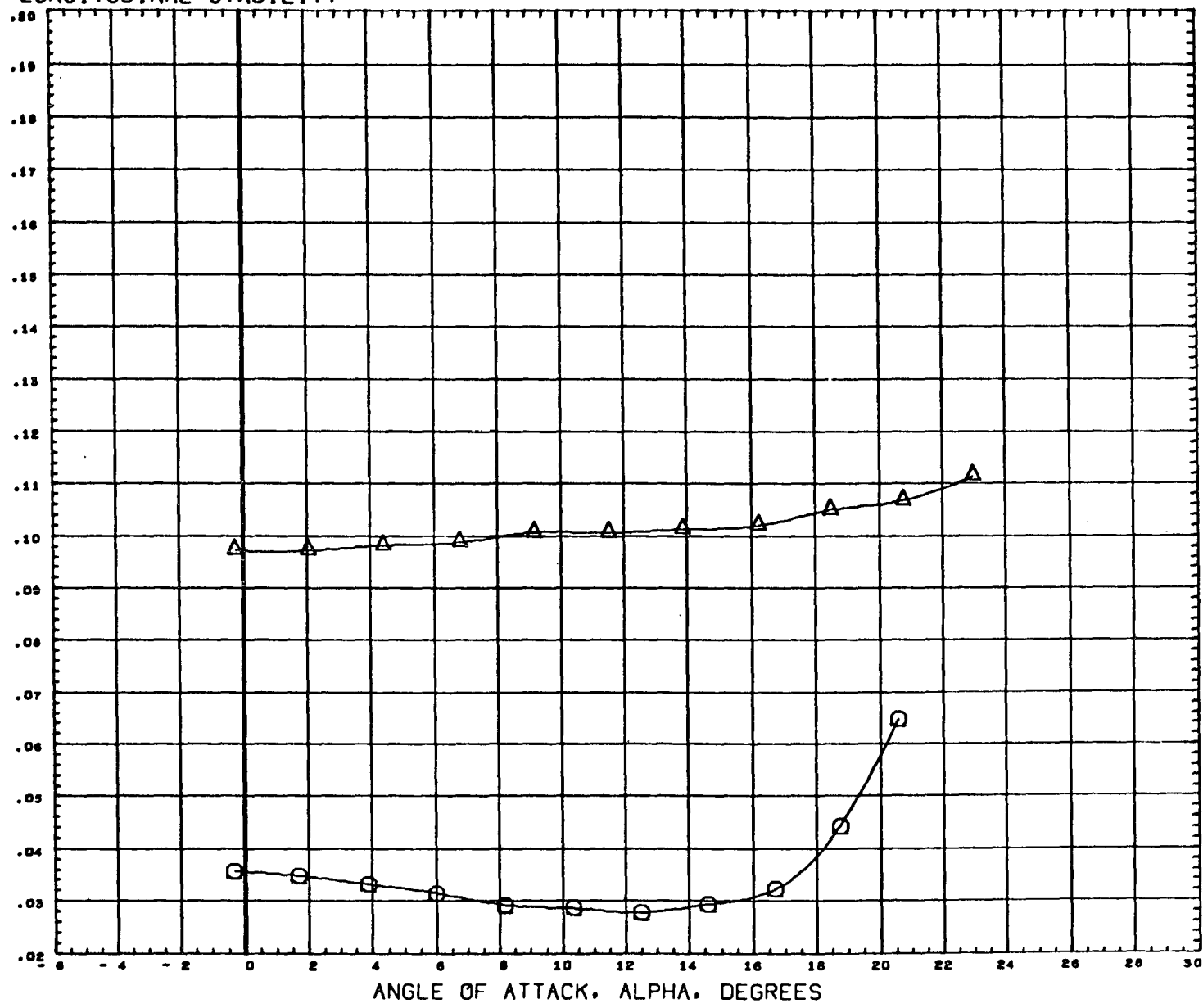
18 MAR 72

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AXIAL FORCE CORRECTED TO FREE STREAM PRESSURE AT THE BASE REGION. CAT

LONGITUDINAL STABILITY



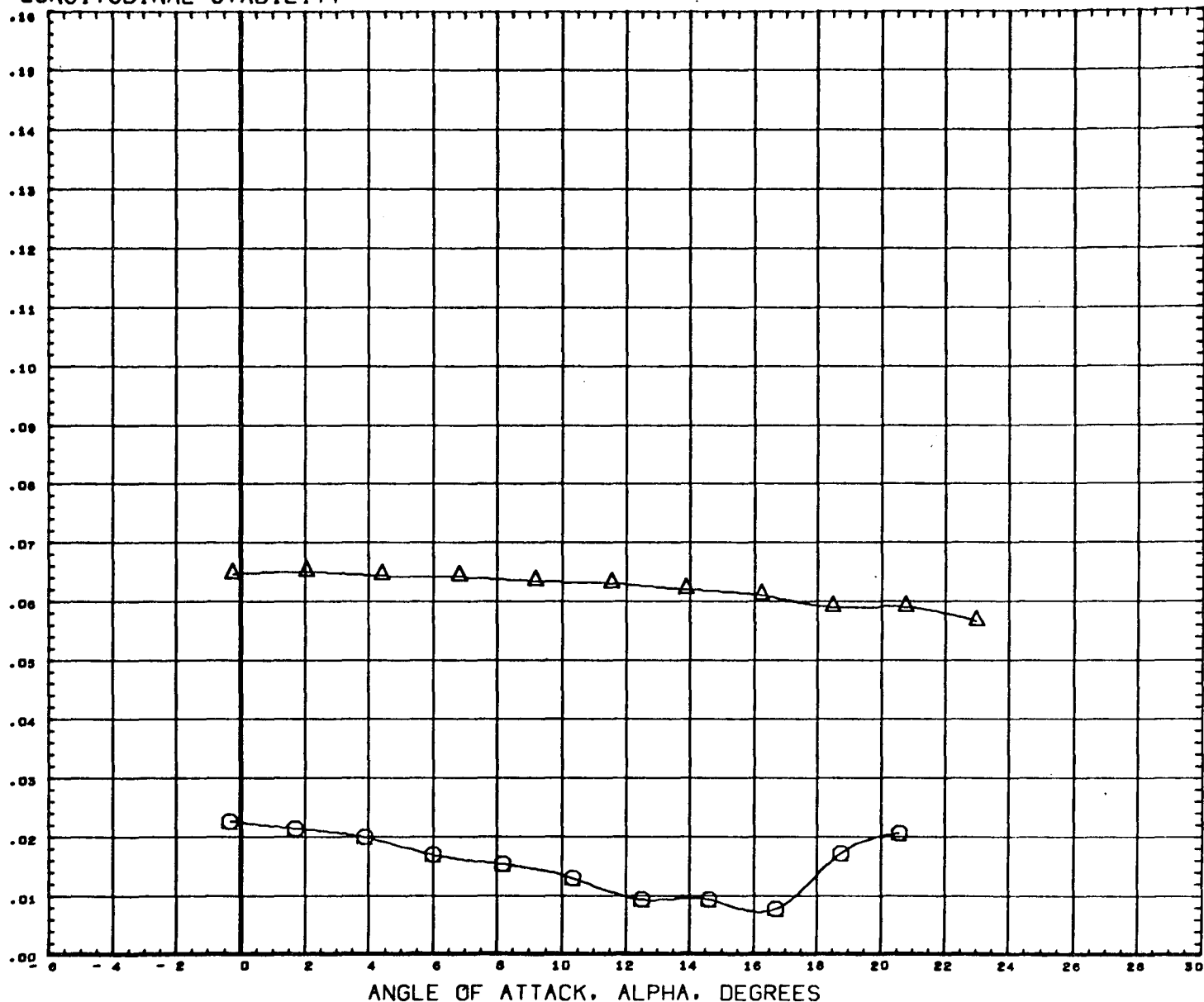
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 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

LONGITUDINAL STABILITY

FOREBODY AXIAL FORCE COEFFICIENT, CAF



ANGLE OF ATTACK, ALPHA, DEGREES

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 \triangle 1.204 RUDFLR 0.000

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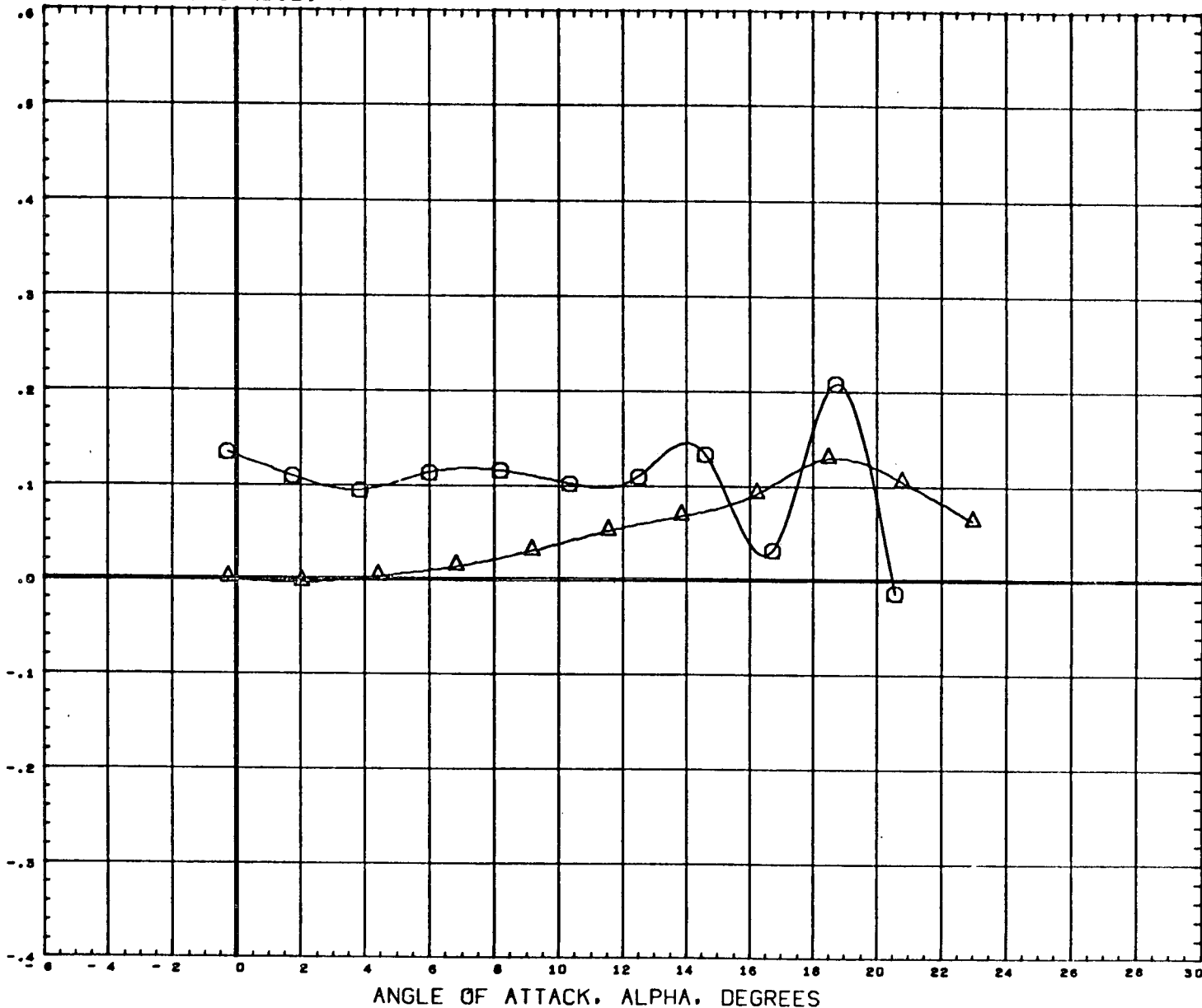
(C5325A) 18 MAR 72

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LONGITUDINAL STABILITY

STATIC LONGITUDINAL STABILITY DERIVATIVE, $D(C_{LM}/C_N)$

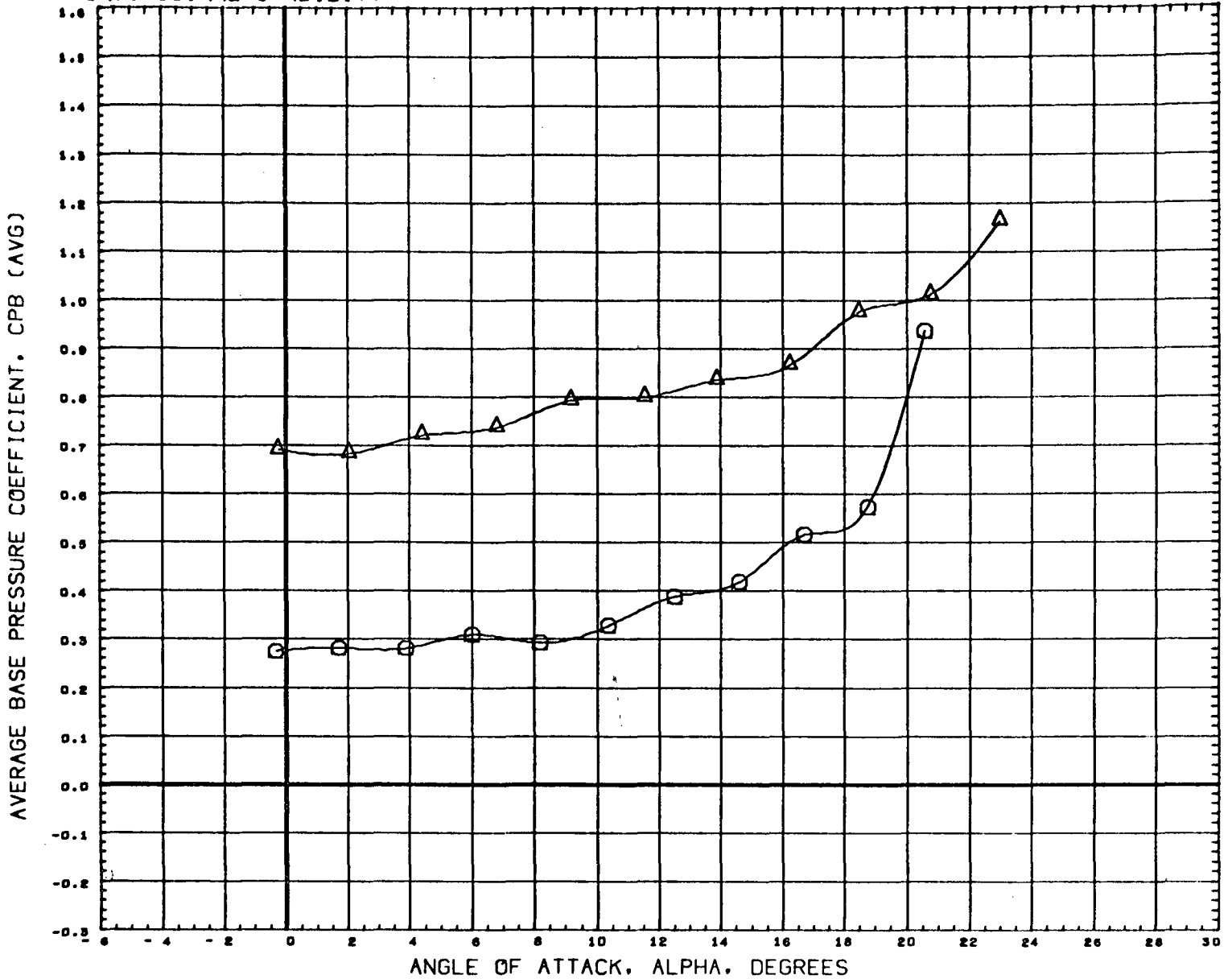


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YMRP	0.0000	IN.
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SCALE	0.0034	

DATA MIST. CODE GC

LONGITUDINAL STABILITY



SYMBOL MACH
 O 0.997
 Δ 1.204

PARAMETRIC VALUES
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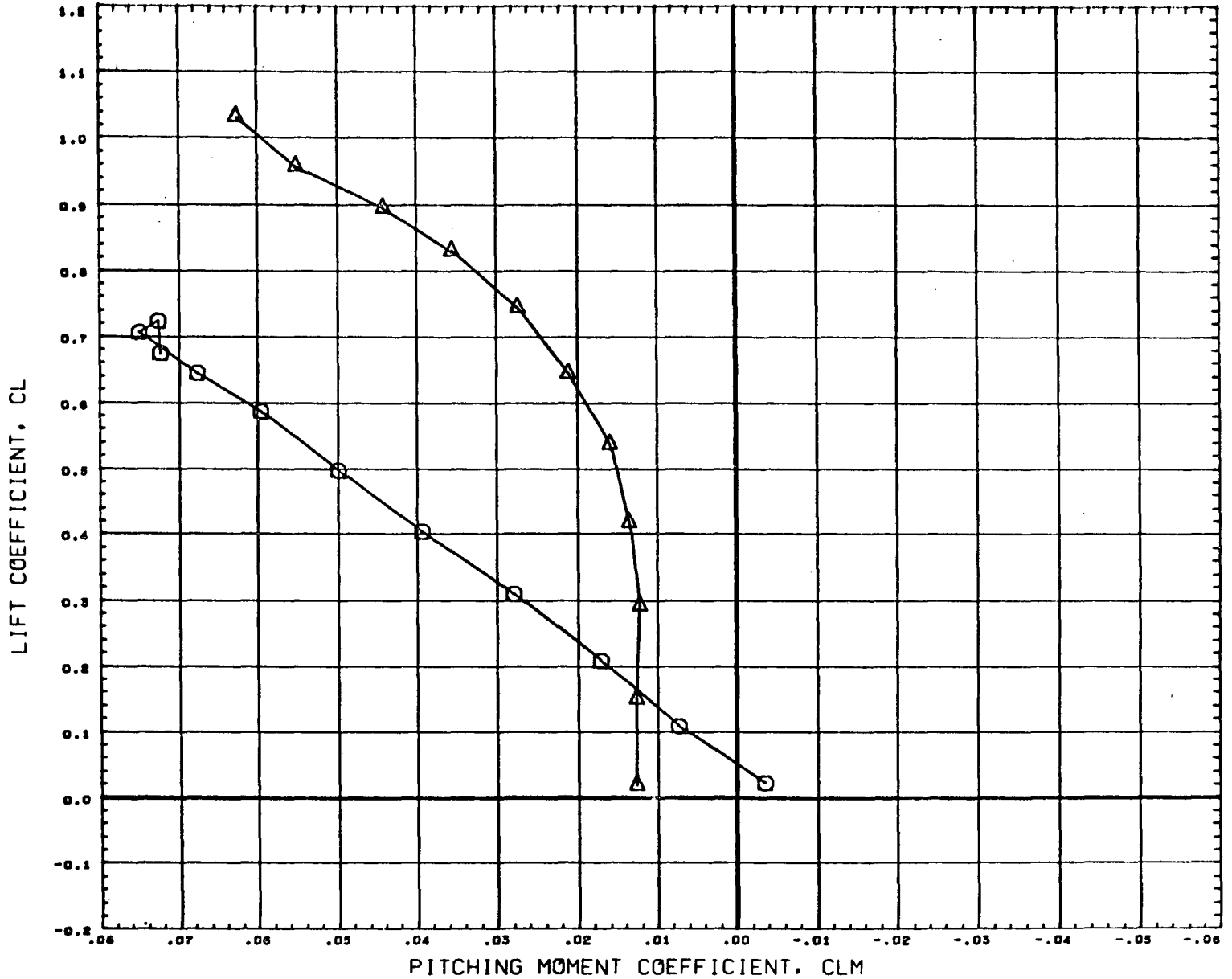
(C5325A)

18 MAR 72

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LONGITUDINAL STABILITY



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△	1.204	RUDFLR	0.000	

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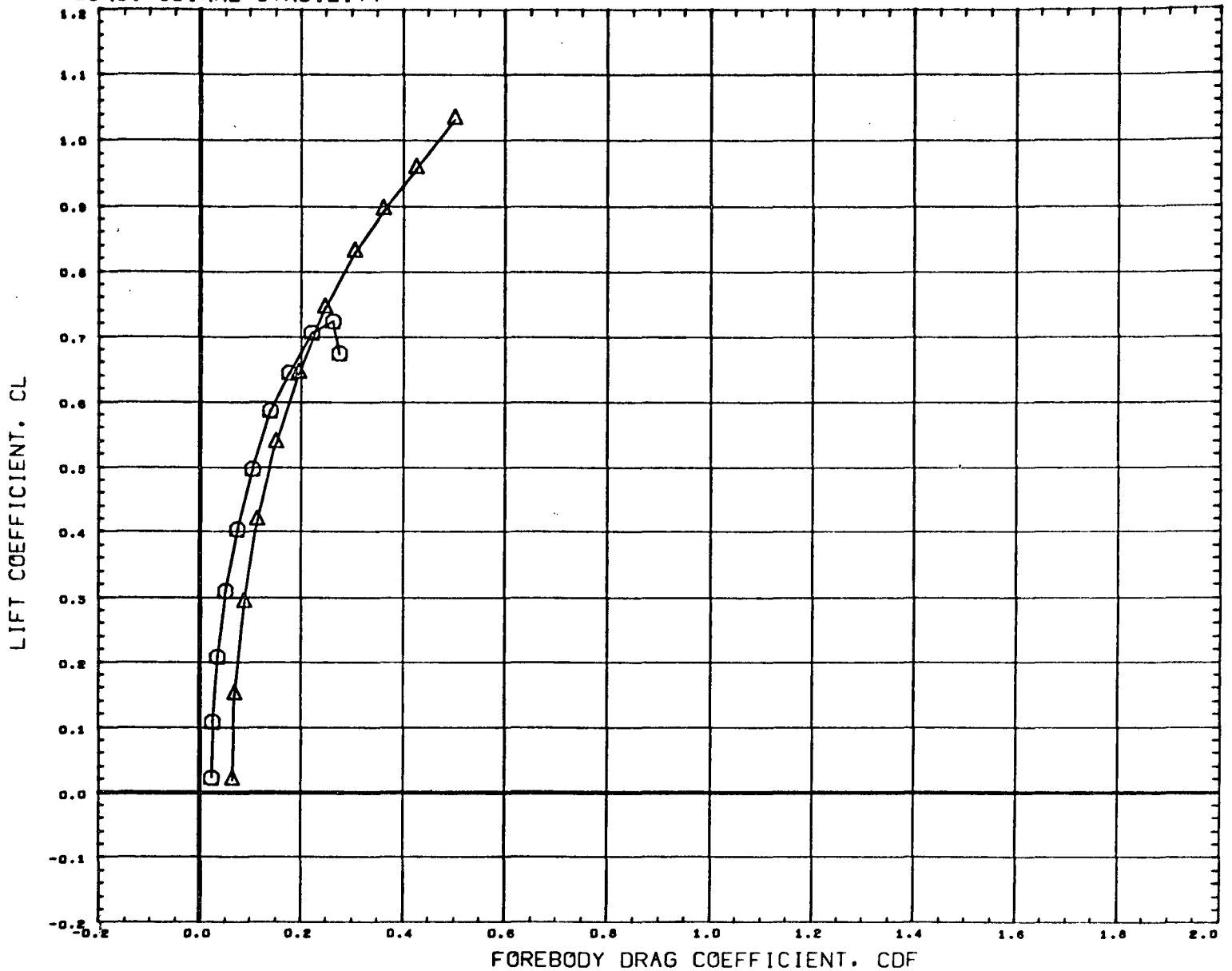
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(C5325A) 18 MAR 72

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LONGITUDINAL STABILITY

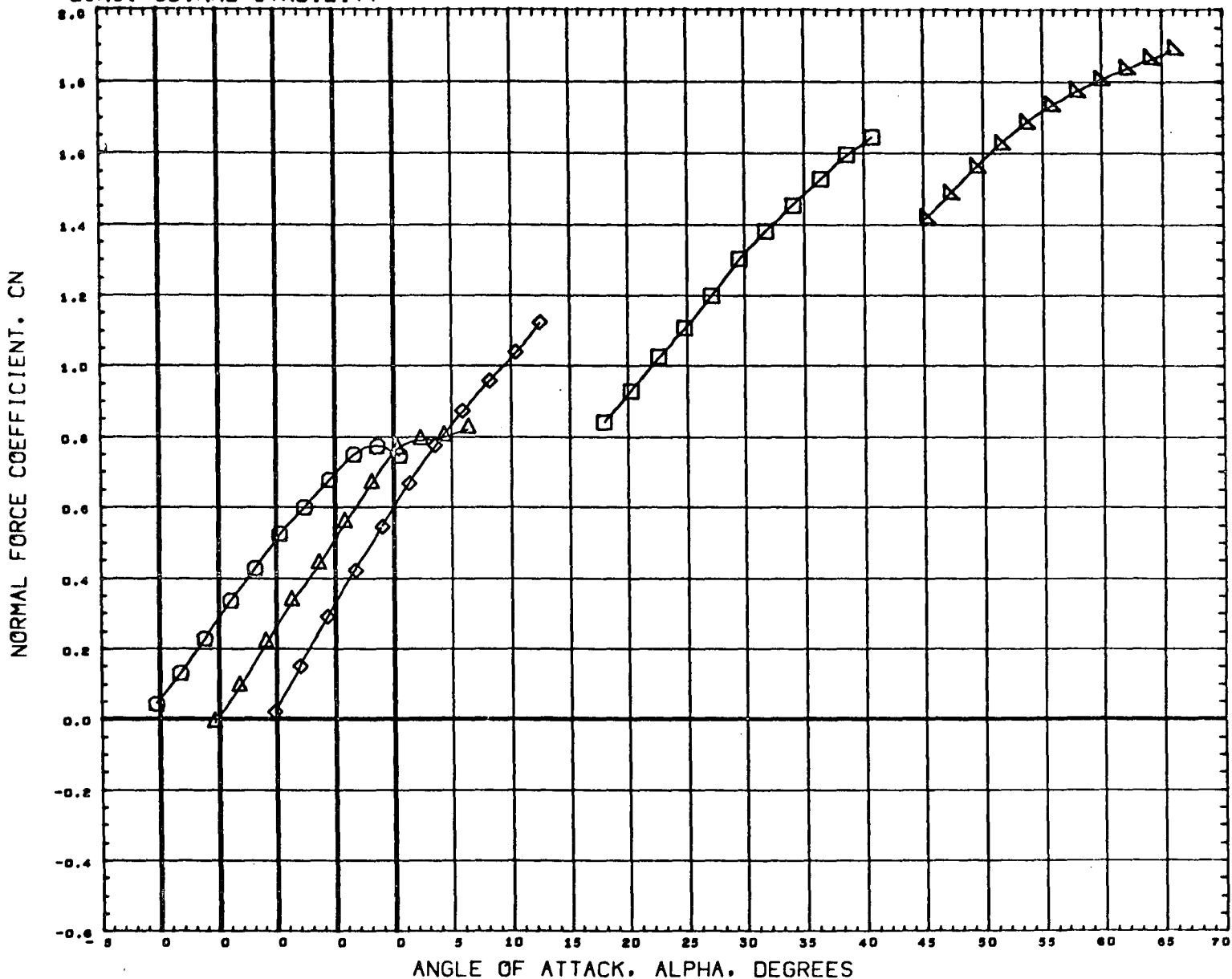


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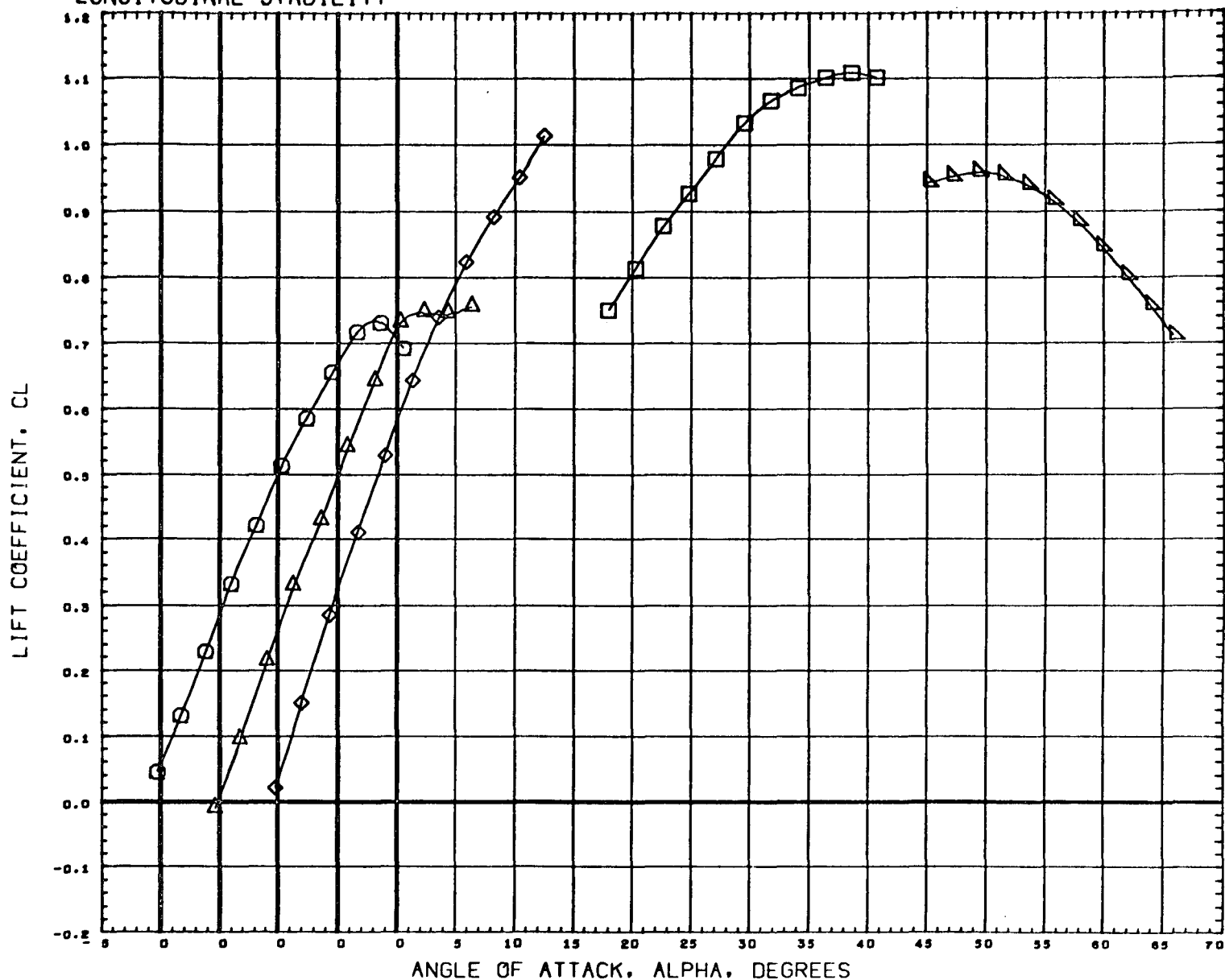
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LONGITUDINAL STABILITY



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		DATA HIST. CODE *GGC						

LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
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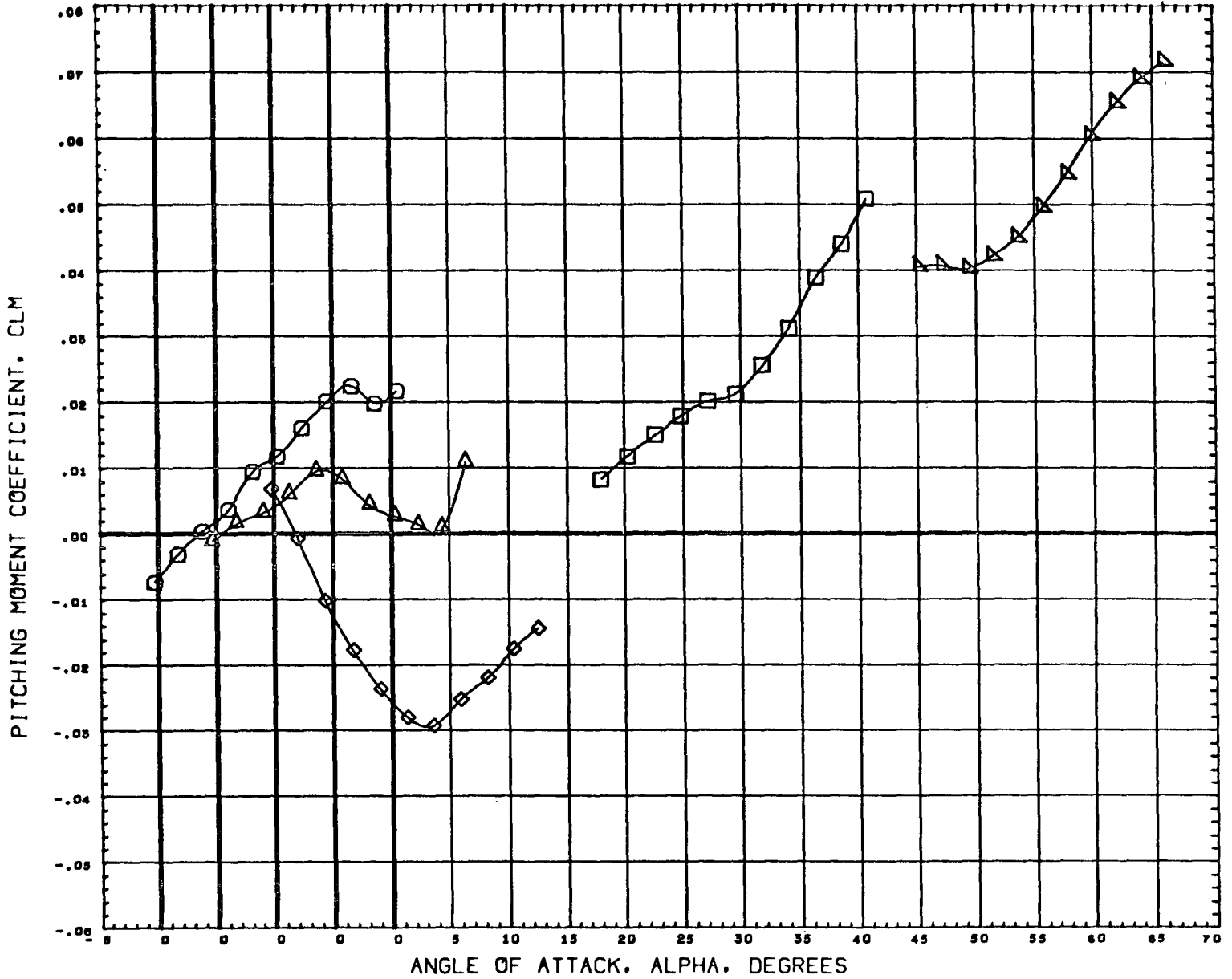
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(C53201) 18 MAR 72

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LONGITUDINAL STABILITY



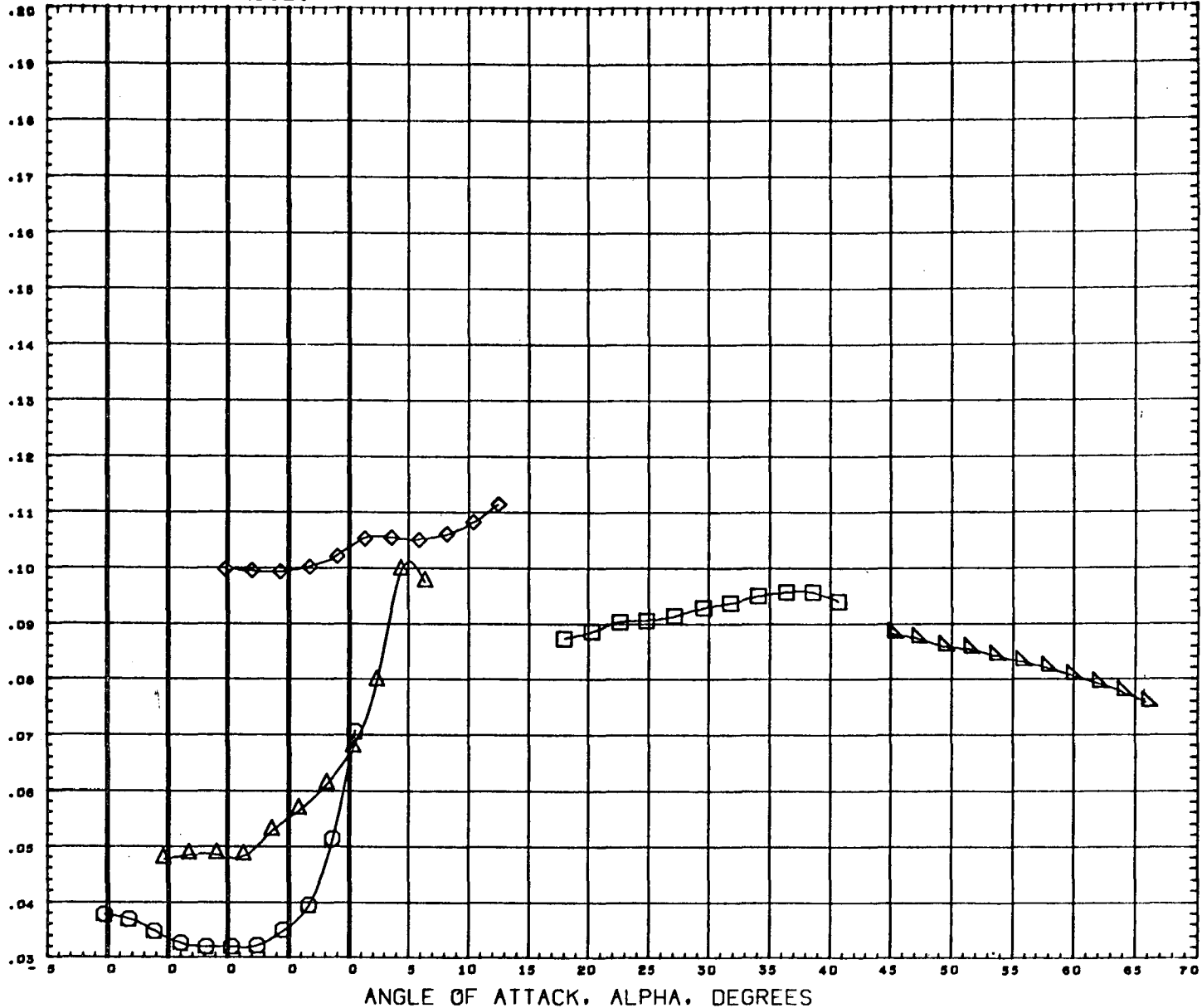
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	3.480			

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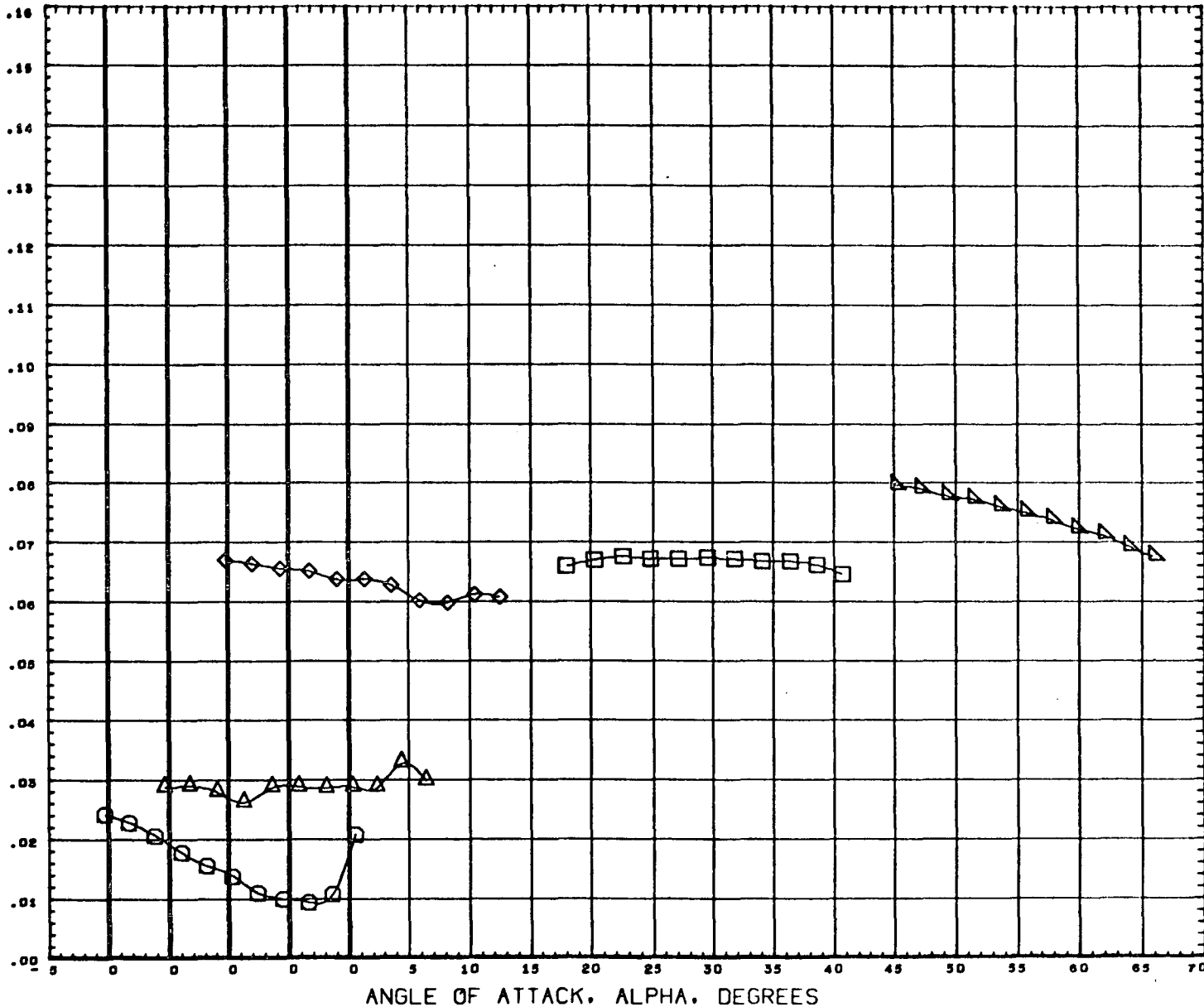
LONGITUDINAL STABILITY



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	0.903	0.000	0.000		4.5080	IN.	
	1.203				5.6550	IN.	
◇	1.958				1.4821	IN.	
□	3.480				0.0000	IN.	
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DATA HIST. CODE *GGC							

LONGITUDINAL STABILITY

FOREBODY AXIAL FORCE COEFFICIENT, CAF

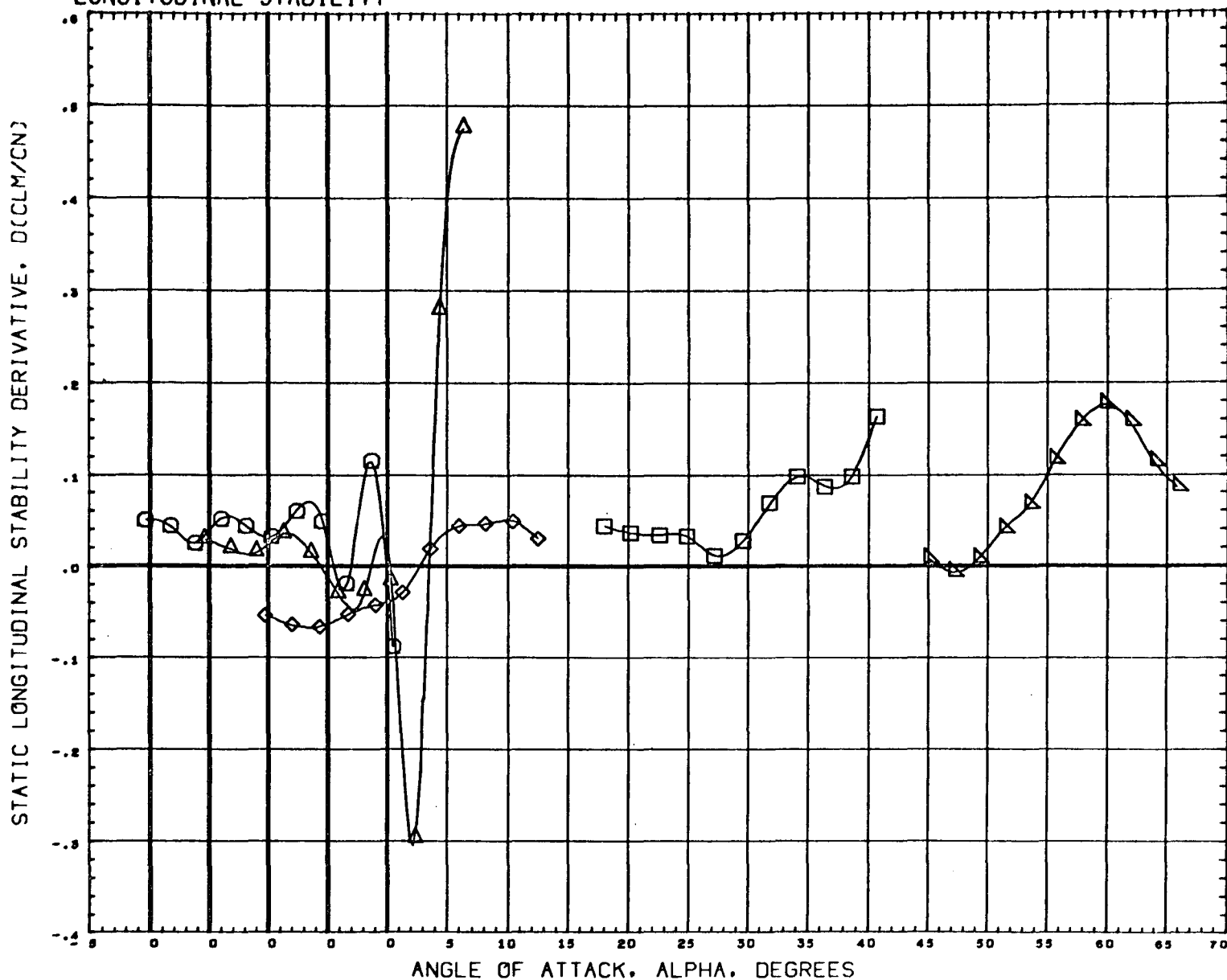


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LONGITUDINAL STABILITY



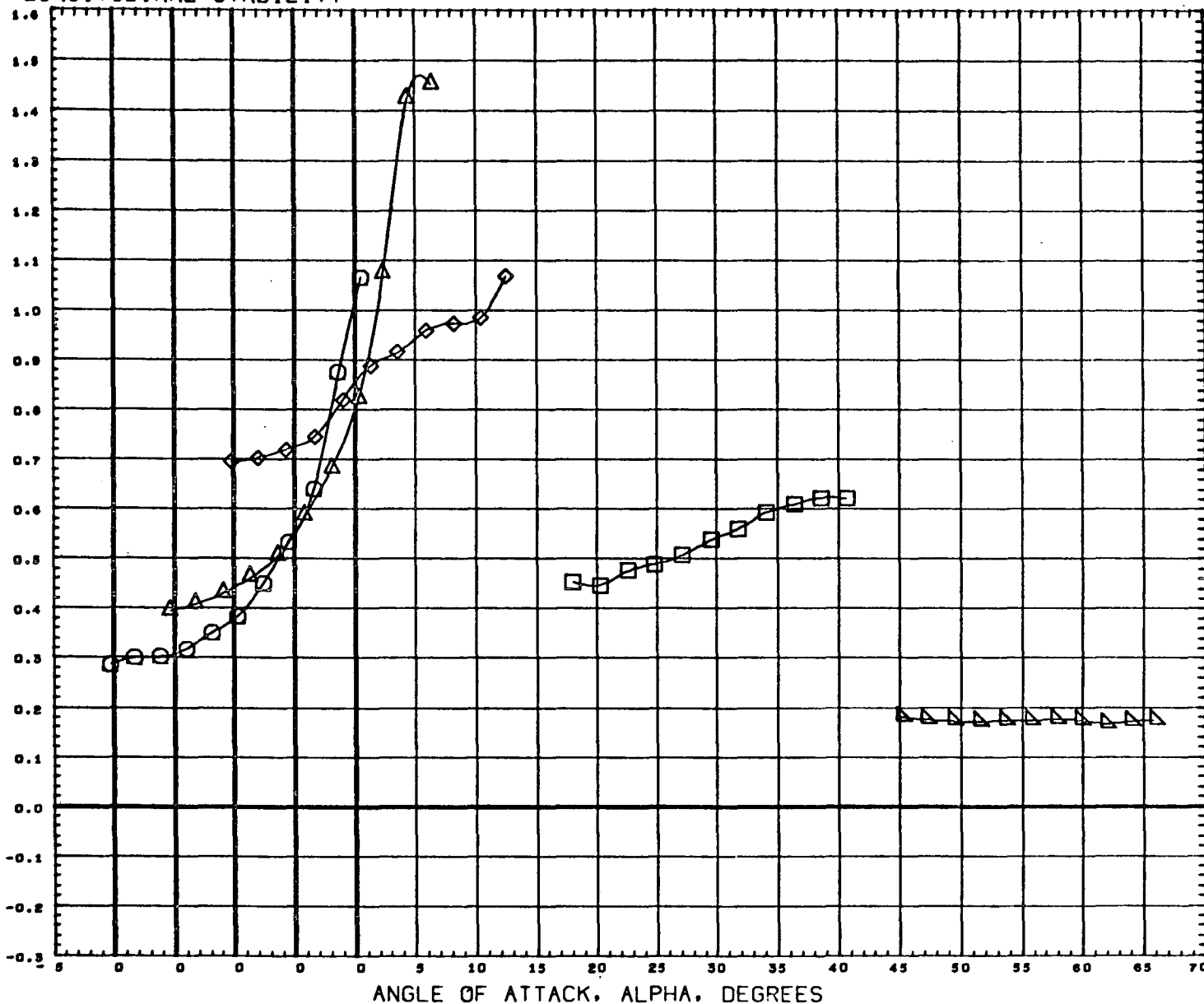
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LONGITUDINAL STABILITY

AVERAGE BASE PRESSURE COEFFICIENT, CPB (AVG)

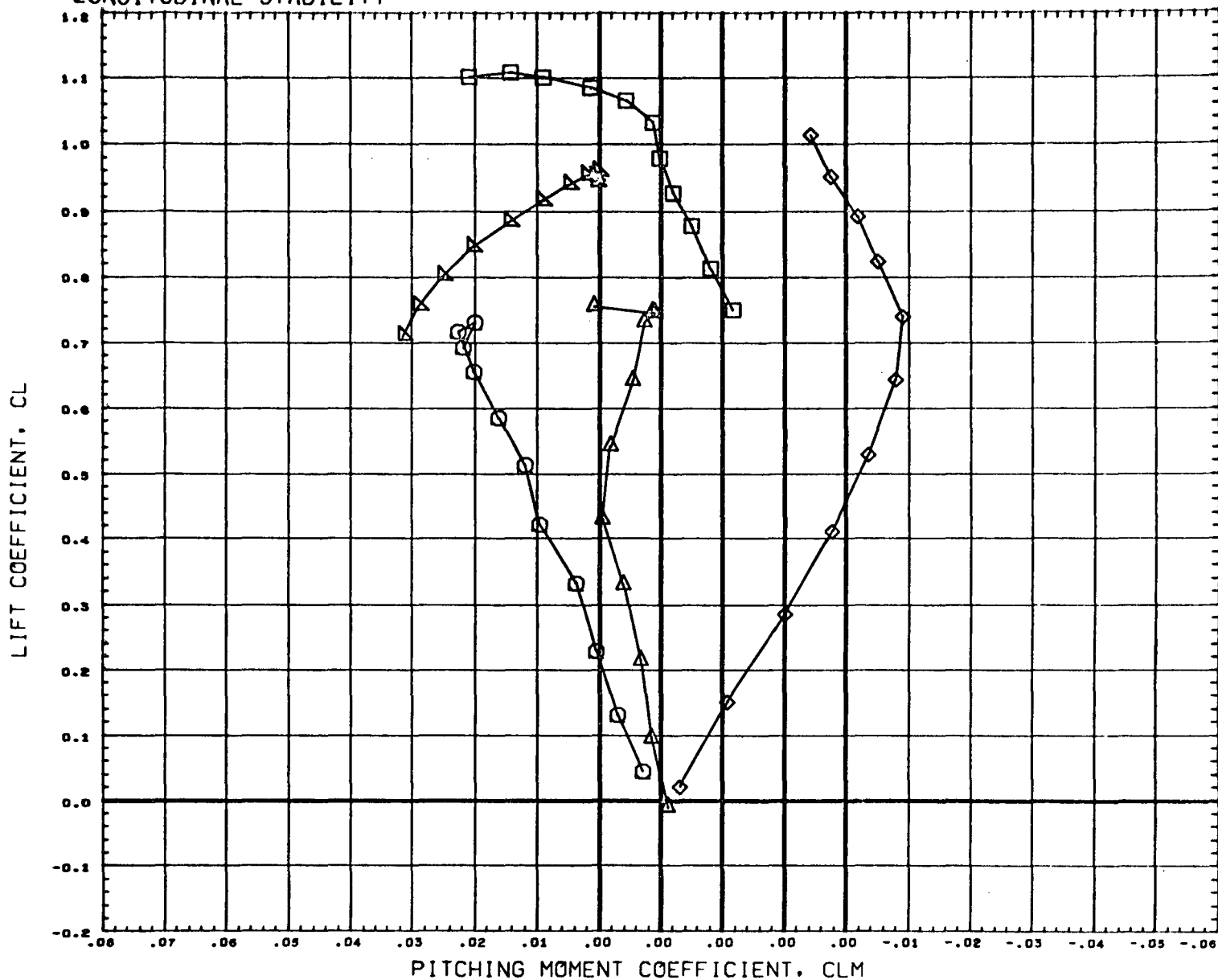


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LONGITUDINAL STABILITY

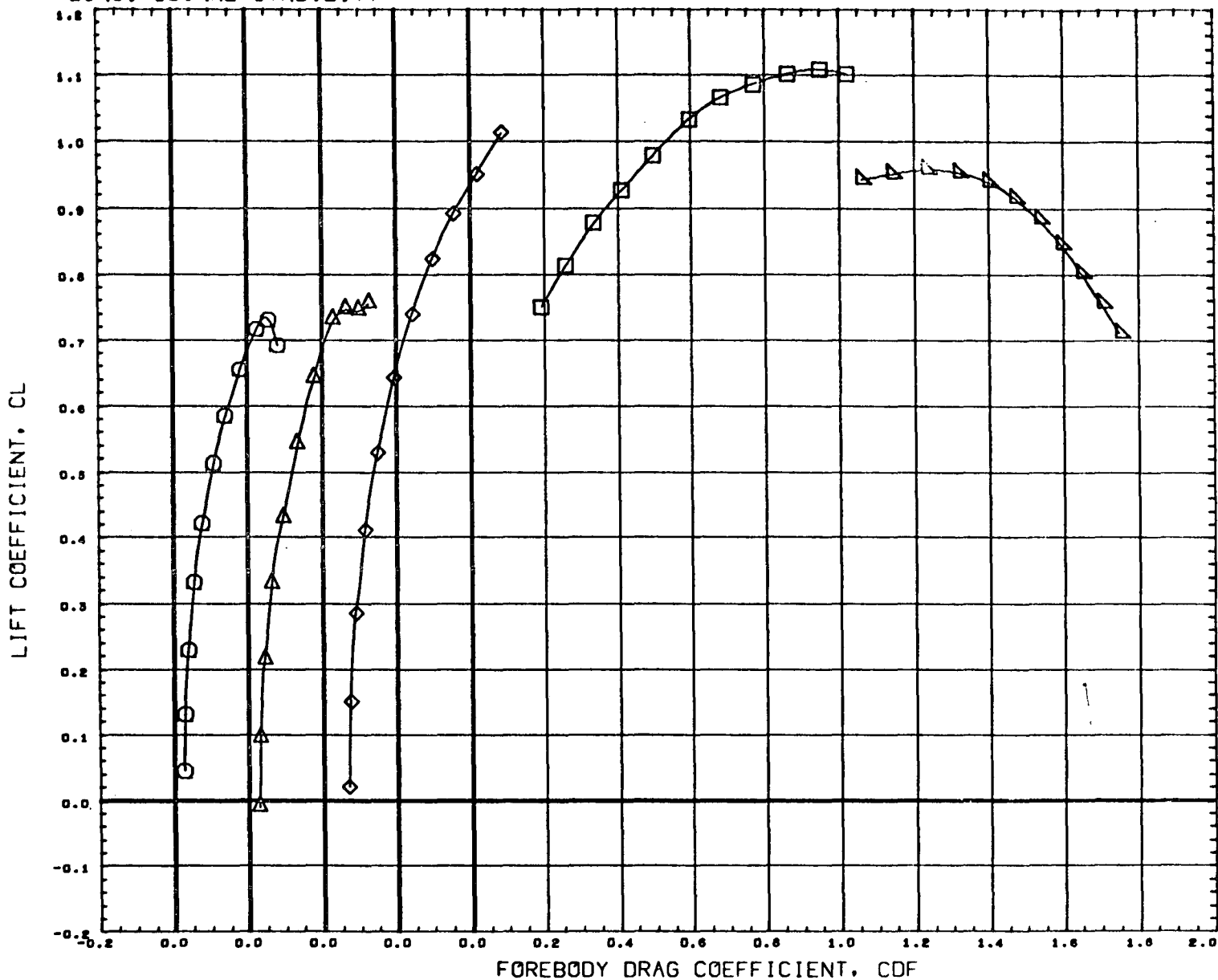


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□	1.958			
×	3.480			

REFERENCE INFORMATION		
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DATA HIST. CODE *GGC

LONGITUDINAL STABILITY

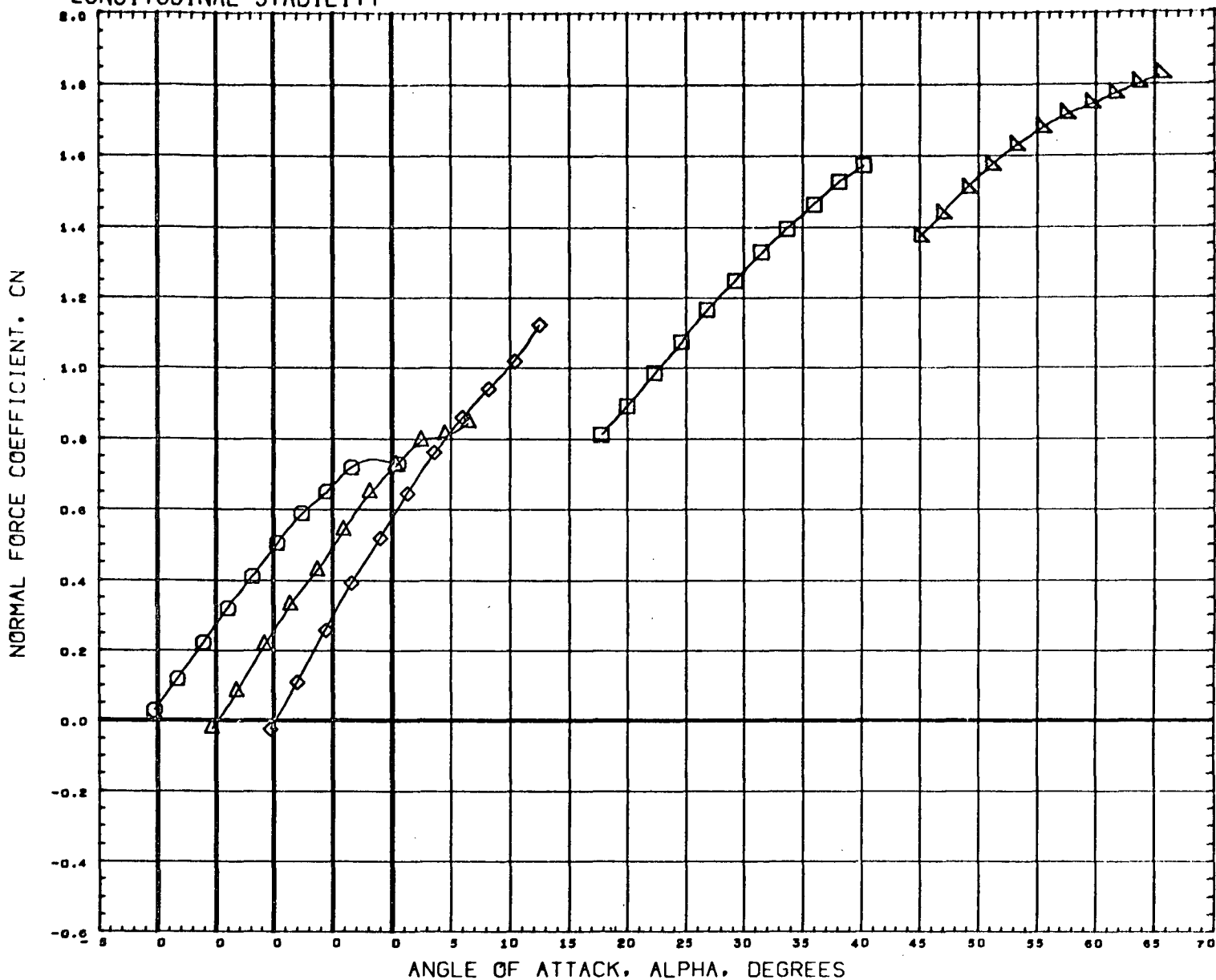


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DATA HIST. CODE *66C

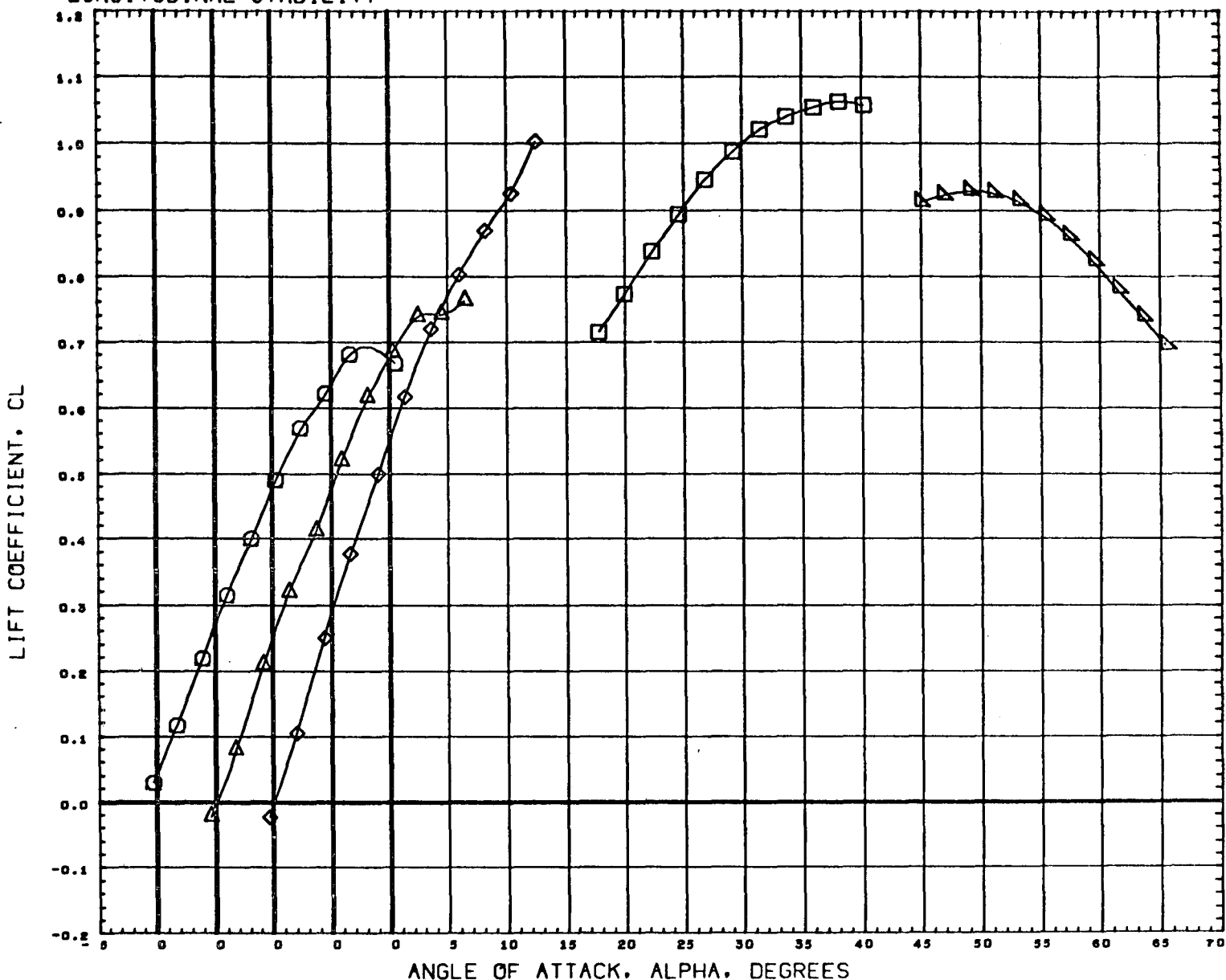
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ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY



SYMBOL		PARAMETRIC VALUES				REFERENCE INFORMATION		
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◇		1.200					BREF	5.6350 IN.
□		1.959					XWRP	1.4821 IN.
◻		3.480					YWRP	0.0000 IN.
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DATA HIST. CODE *GGC*G								

LONGITUDINAL STABILITY

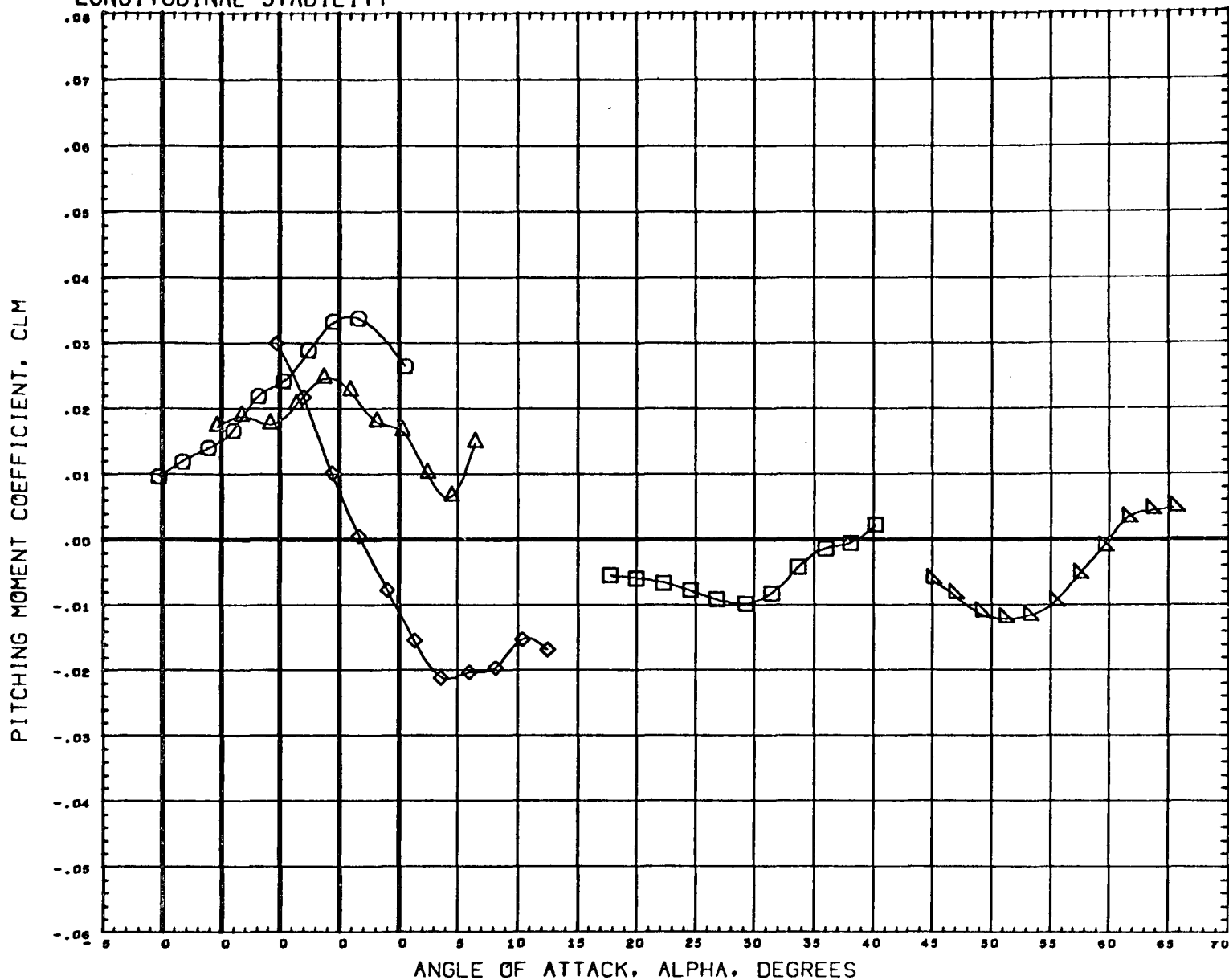


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XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY



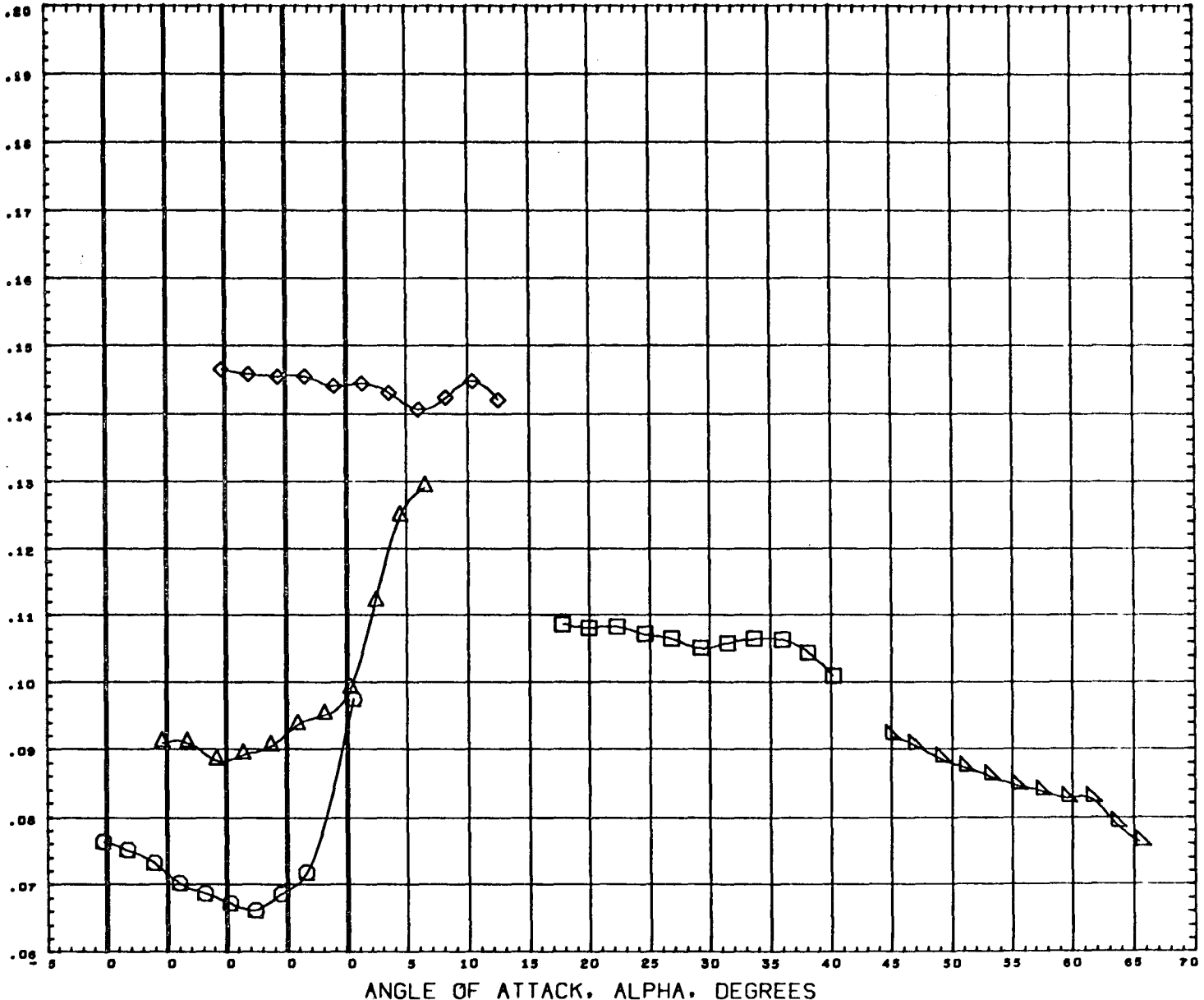
SYMBOL ○ △ ◇ □	MACH	PARAMETRIC VALUES			
	0.599	BETA	0.000	RUDDER	0.000
	0.905	RUDFLR	30.000		
	1.200				
	1.959				
	3.480				

DATA HIST. CODE *66C*G

REFERENCE INFORMATION		
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LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
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SCALE	0.0034	

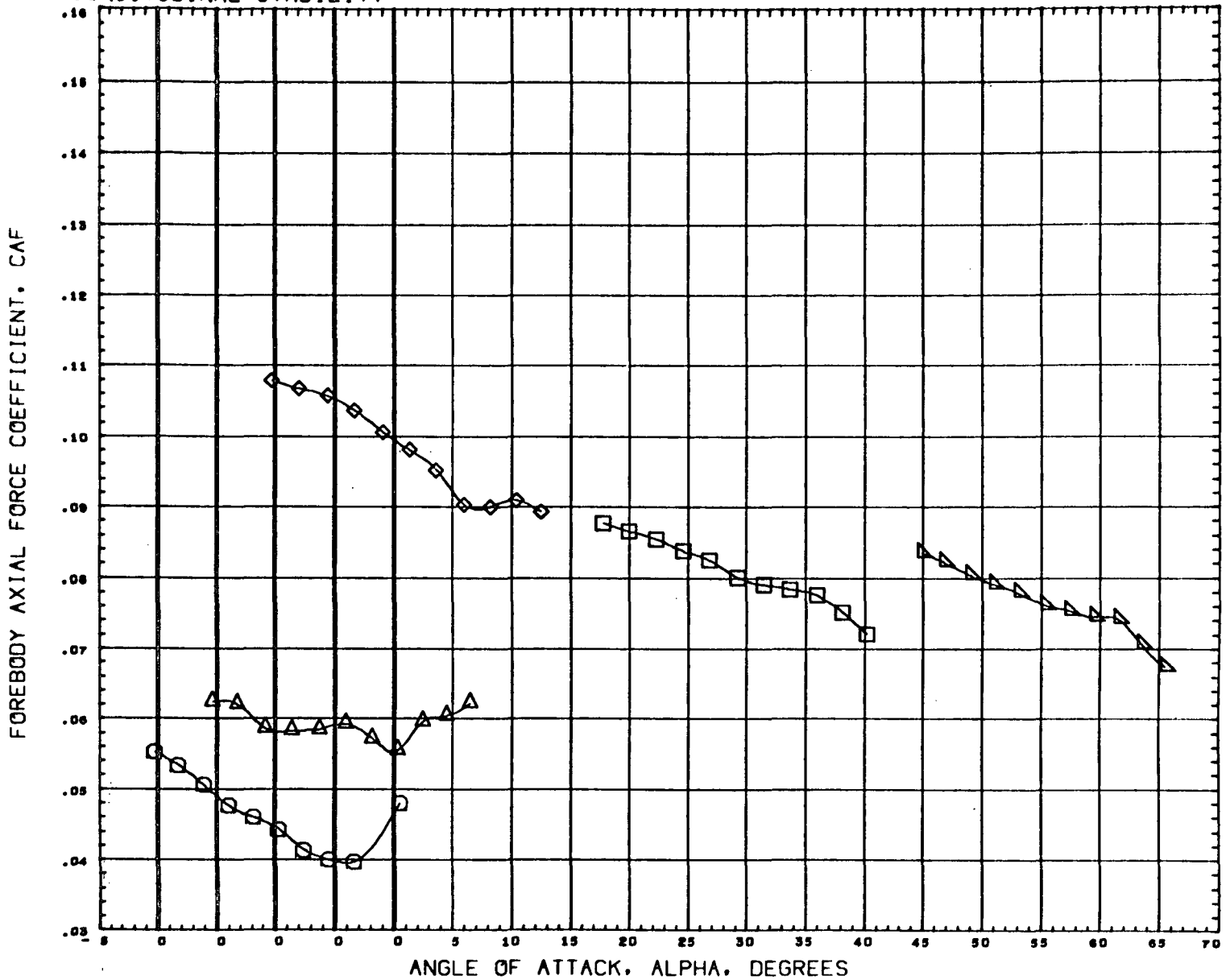
AXIAL FORCE CORRECTED TO FREE STREAM PRESSURE AT THE BASE REGION. CAT

LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			REFERENCE INFORMATION		
◇	0.999	BETA	0.000	RUDDER	0.000	SREF	14.6836 SQ. IN.
◇	0.905	RUDFLR	30.000			LREF	4.5080 IN.
◇	1.200					BREF	5.6550 IN.
◇	1.959					XMRP	1.4821 IN.
◇	3.480					YMRP	0.0000 IN.
◇						ZMRP	0.0000 IN.
◇						SCALE	0.0034
◇		DATA HIST. CODE #66C#6					

LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
△	0.599	BETA	0.000	RUDDER	0.000
◇	0.905	RUDFLR	30.000		
□	1.200				
◻	1.959				
◻	3.480				

REFERENCE INFORMATION		
SREF	14.6836	90 IN.
LREF	4.5080	IN.
BREF	9.6590	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE *GGC*G

M513-MSFC MODELAR1216I-2

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(S53191)

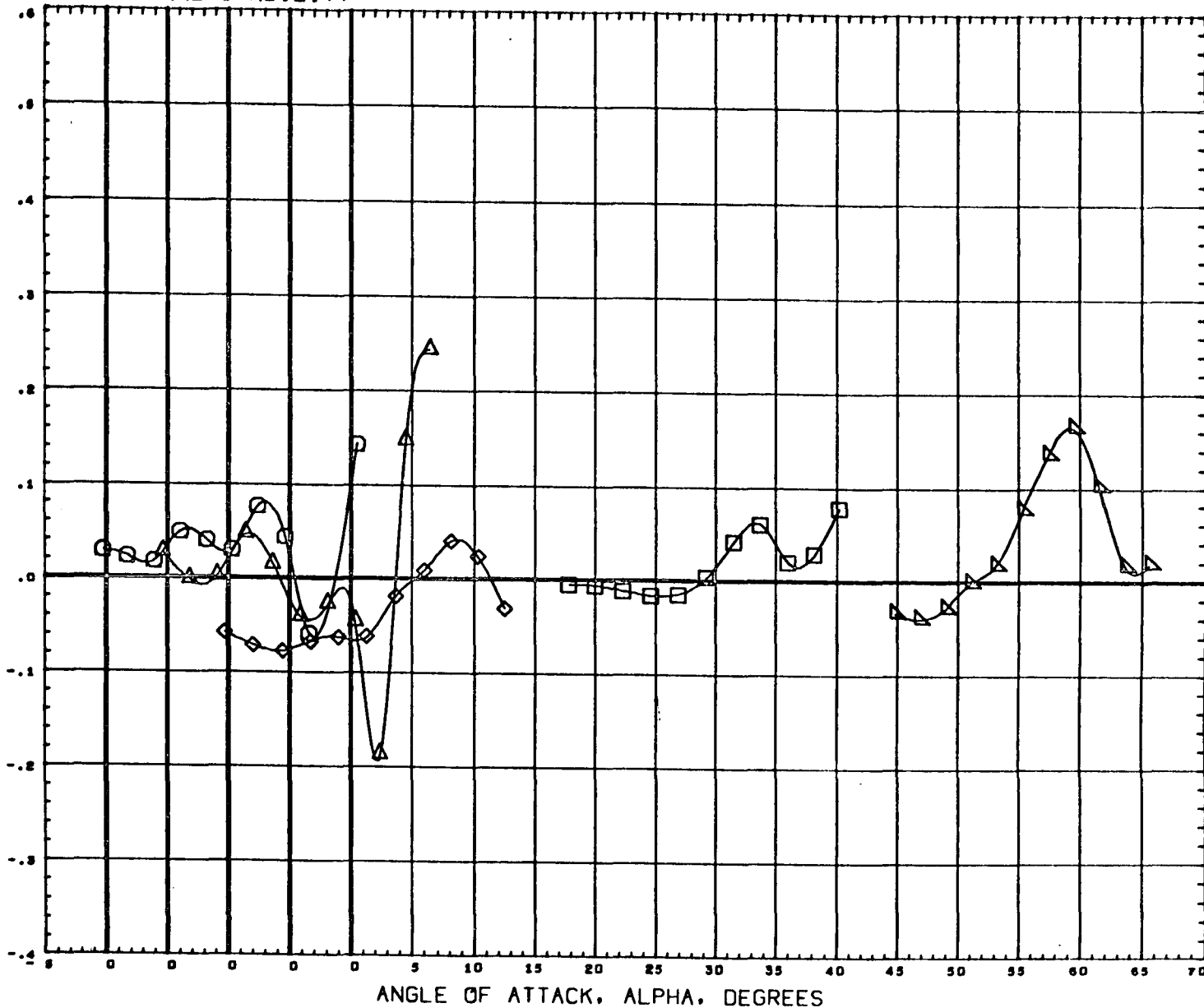
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LONGITUDINAL STABILITY

STATIC LONGITUDINAL STABILITY DERIVATIVE, D(CLM/CN)

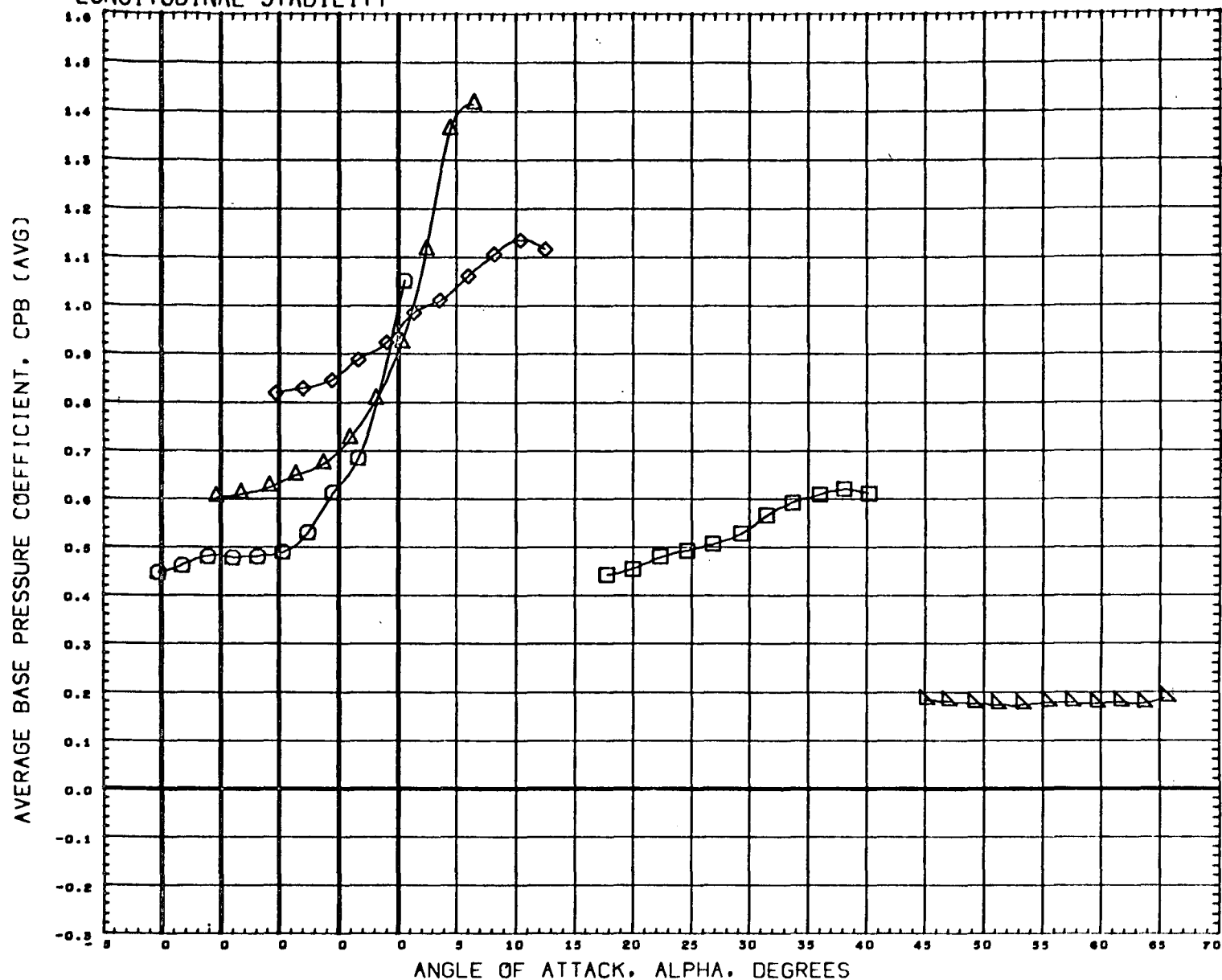


SYMBOL MACH
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 0.905 RUDFLR 30.000
 1.200
 1.959
 3.480

DATA HIST. CODE *GGC*G

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 LREF 4.5000 IN.
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 YNRP 0.0000 IN.
 ZNRP 0.0000 IN.
 SCALE 0.0034

LONGITUDINAL STABILITY



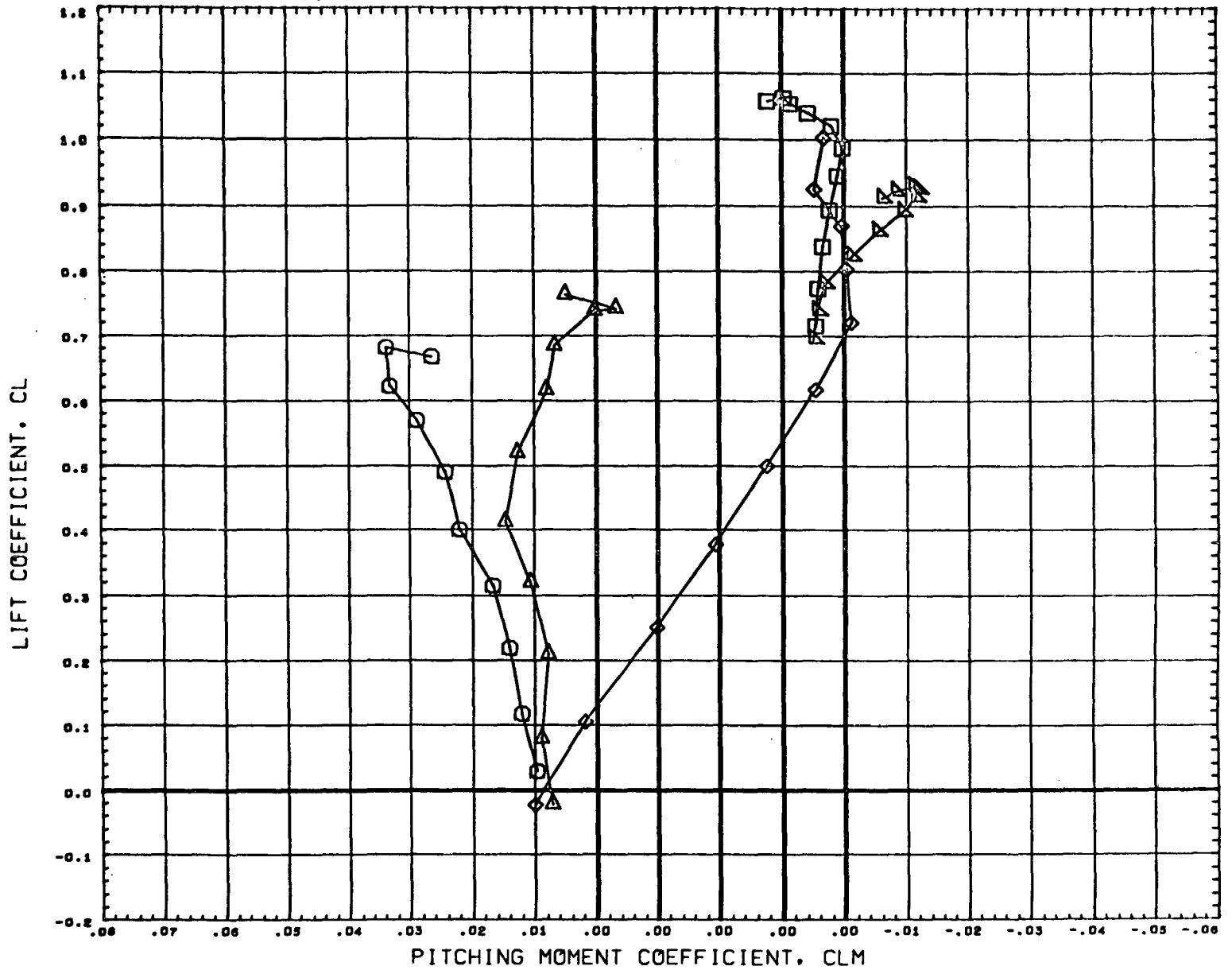
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 3.400

PARAMETRIC VALUES
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 RUDDLER 30.000

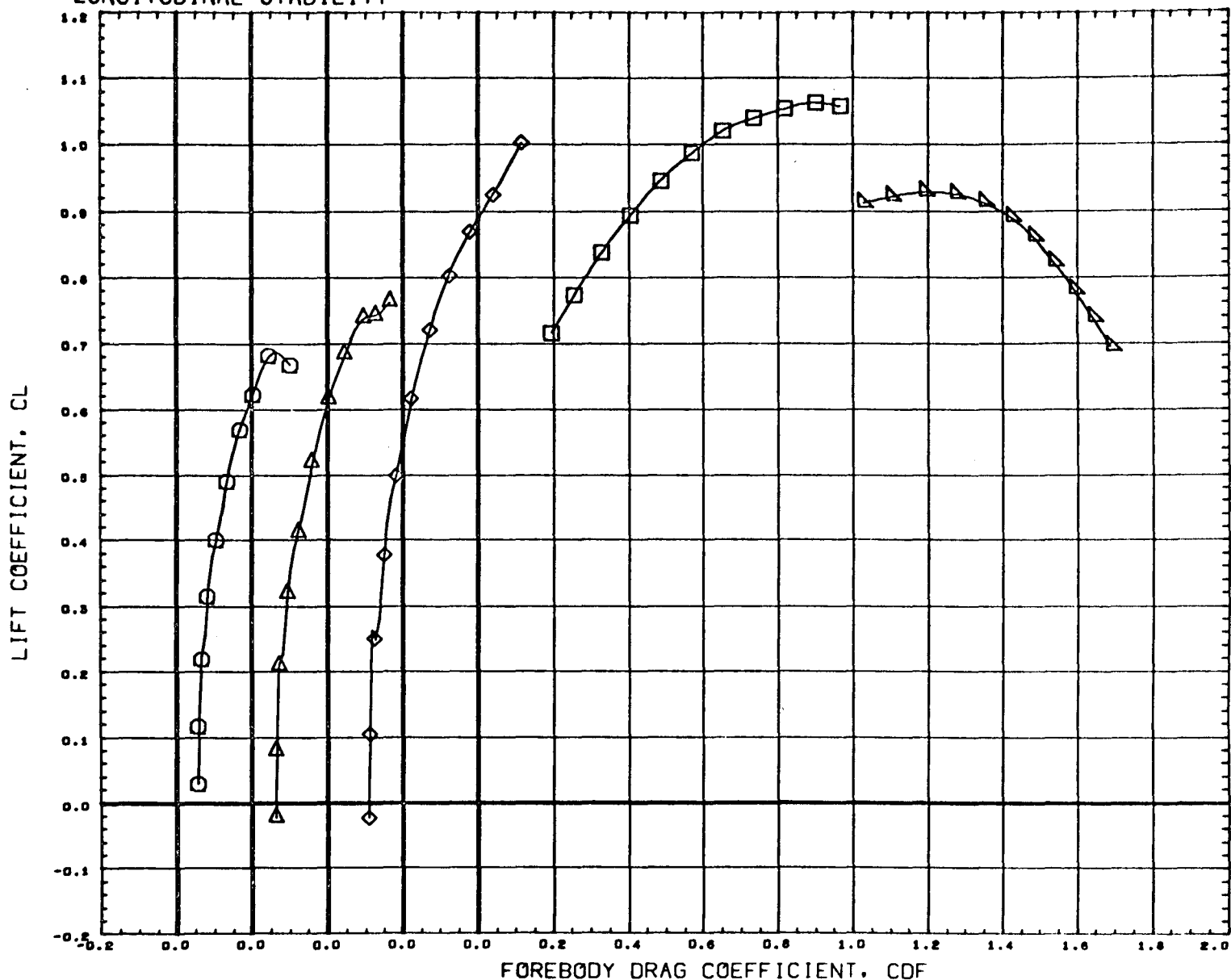
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 LREF 4.9080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE *GGC*G

LONGITUDINAL STABILITY



LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
○	0.599	BETA	0.000	RUDDER
△	0.905	RUDFLR	30.000	0.000
◇	1.200			
□	1.959			
◻	3.480			

DATA HIST. CODE *GGC*G

REFERENCE INFORMATION		
SREF	14.6836	80. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

M513-MSFC MODELAR1216I-2

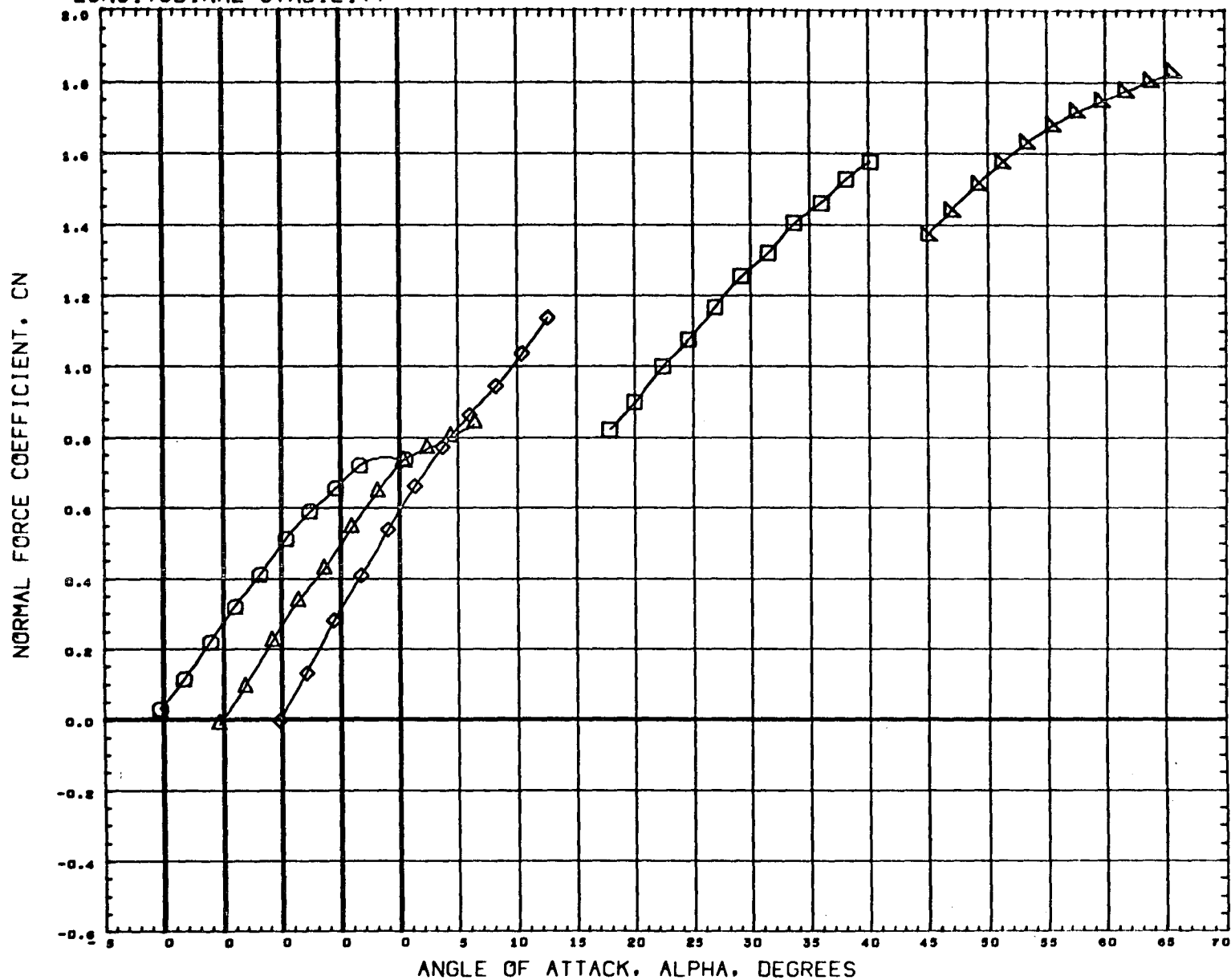
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(S53191) 18 MAR 72

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LONGITUDINAL STABILITY

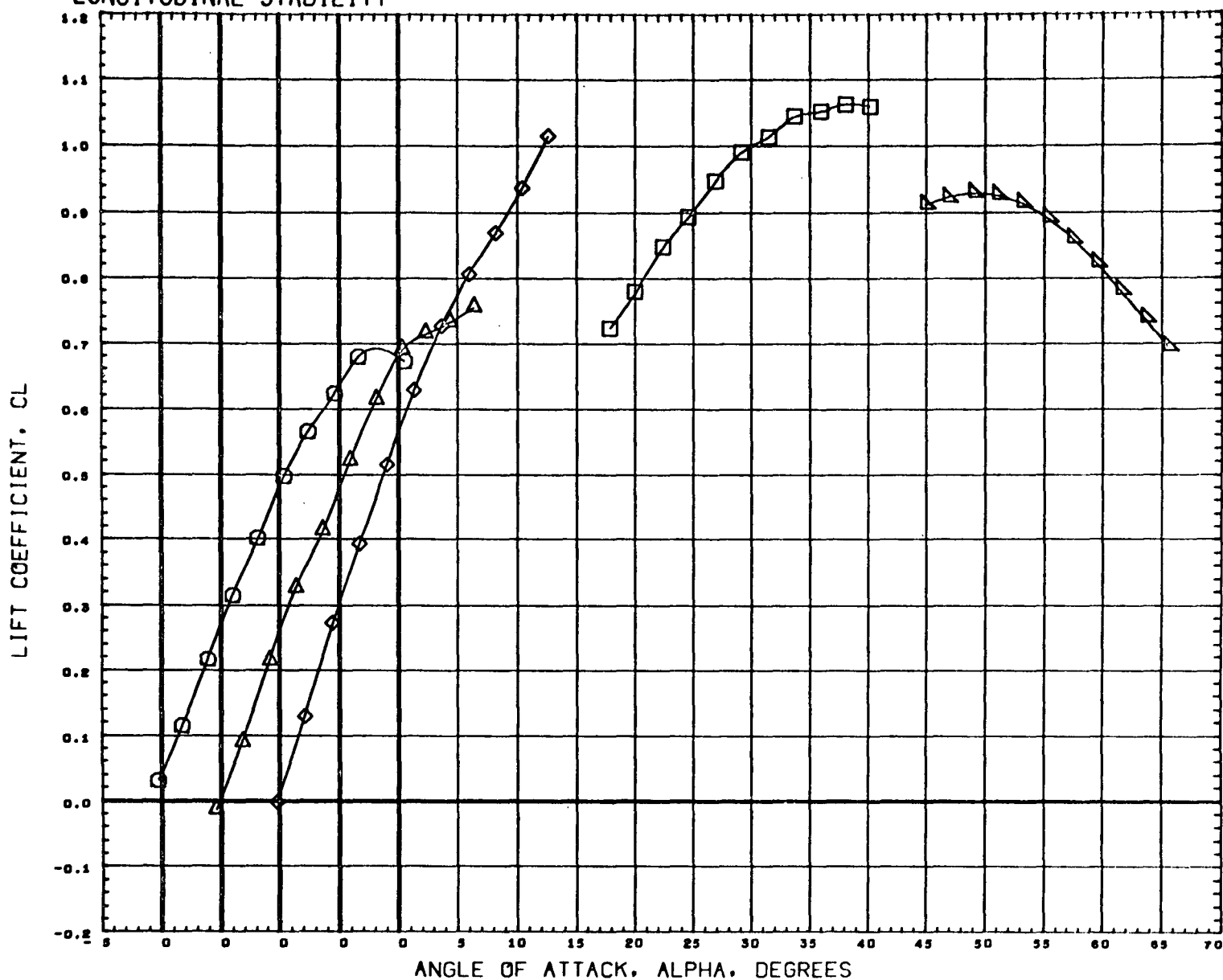


SYMBOL	MACH	PARAMETRIC VALUES		
○	0.998	BETA	0.000	RUDDER
△	0.997	RUDDLR	30.000	0.000
◇	1.194			
□	1.956			
◇	3.480			

DATA HIST. CODE *GGC*G

REFERENCE INFORMATION		
SREF	14.6836	80. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
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YMRF	0.0000	IN.
ZMRF	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY

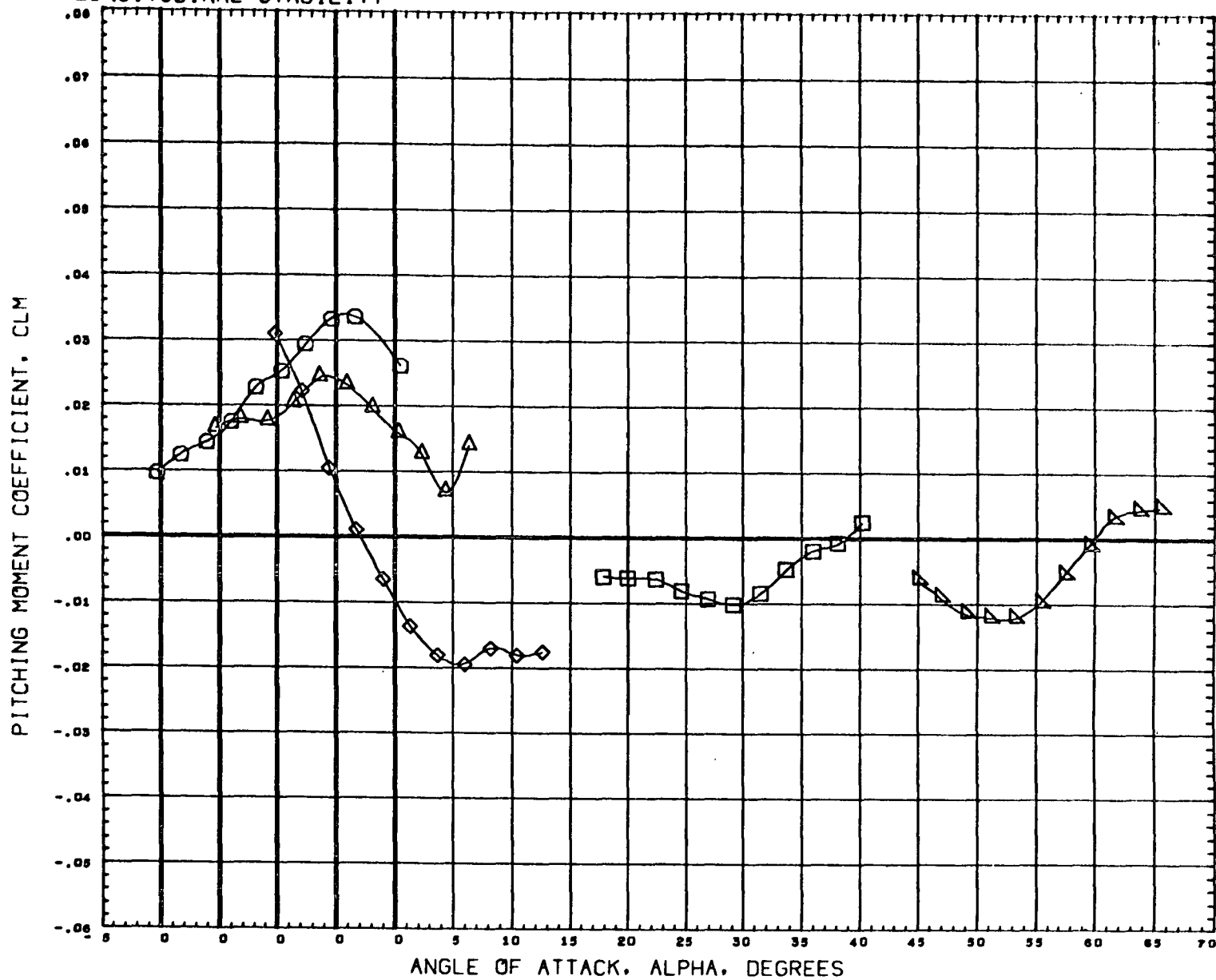


SYMBOL	MACH	PARAMETRIC VALUES		
○	0.998	BETA	0.000	RUDDER
△	0.897	RUDFLR	30.000	0.000
◇	1.194			
□	1.936			
	3.480			

DATA HIST. CODE *GGC*G

REFERENCE INFORMATION		
SREF	14.6836	80. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY



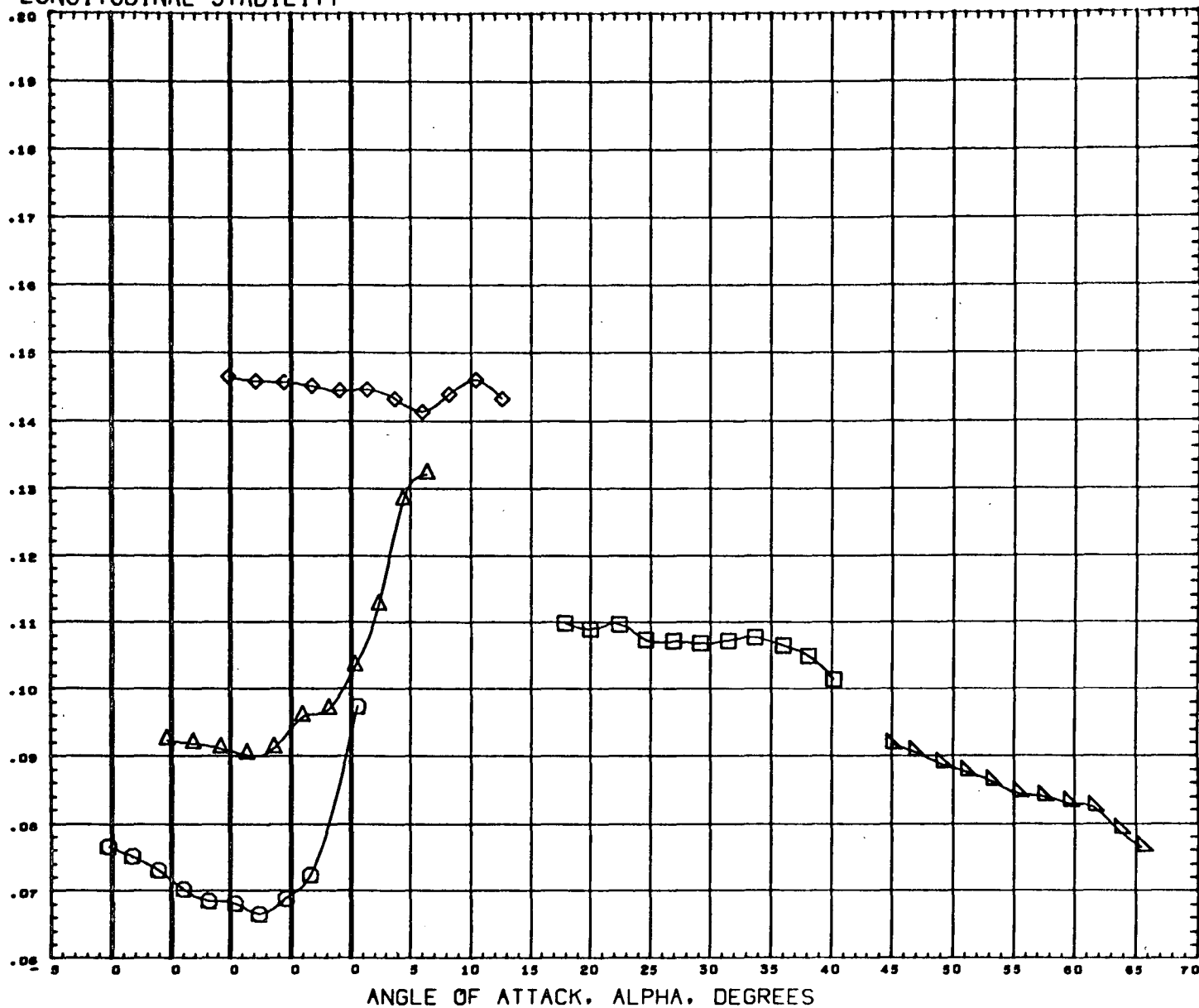
SYMBOL	MACH	PARAMETRIC VALUES			
◇	0.598	BETA	0.000	RUDDER	0.000
△	0.697	RUDFLR	30.000		
□	1.194				
	1.956				
	3.480				

DATA HIST. CODE *GGC*G

REFERENCE INFORMATION		
SREF	14.6836	sq. in.
LREF	4.5080	in.
BREF	5.6550	in.
XMRP	1.4621	in.
YMRP	0.0000	in.
ZMRP	0.0000	in.
SCALE	0.0034	

AXIAL FORCE CORRECTED TO FREE STREAM PRESSURE AT THE BASE REGION. CAT

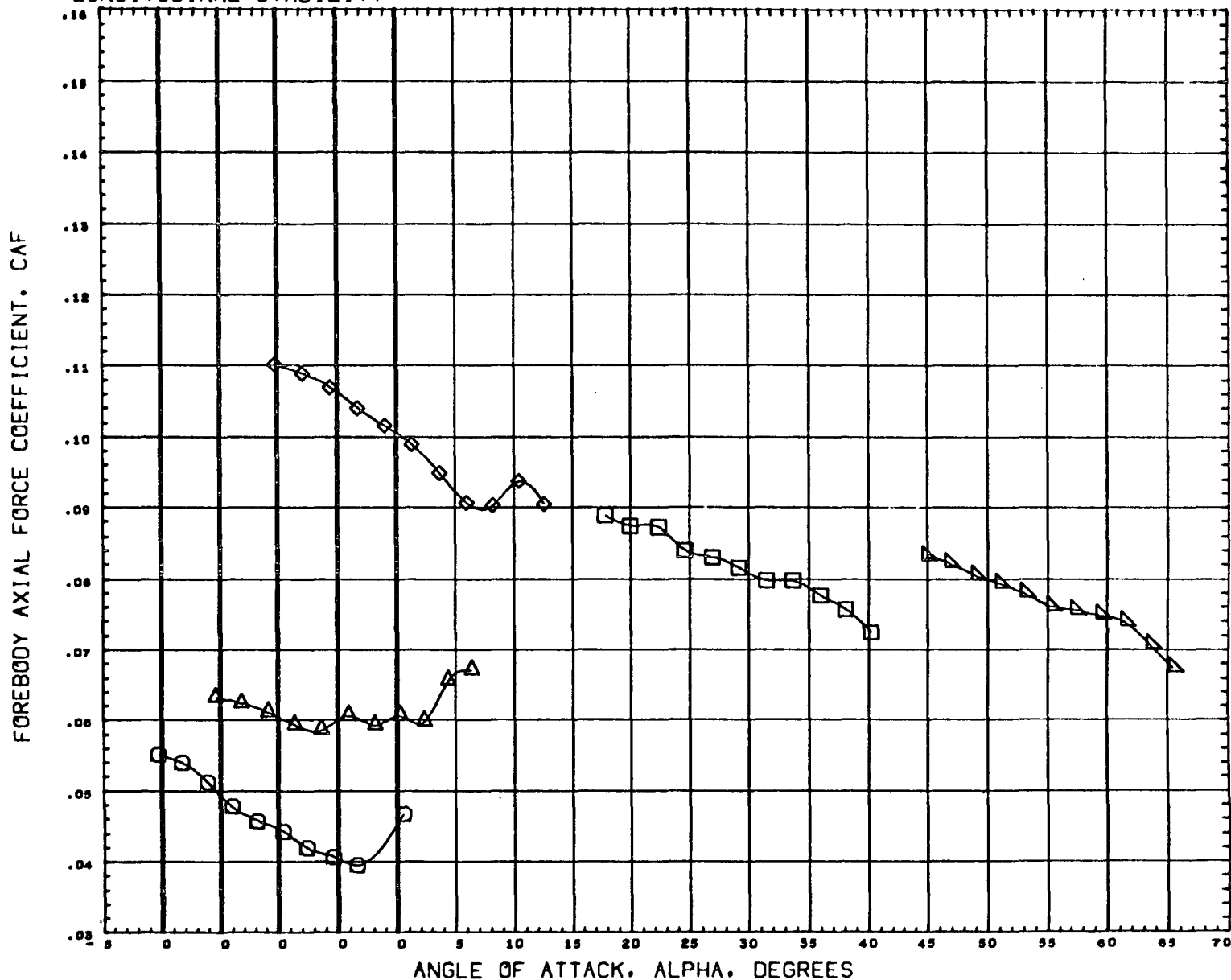
LONGITUDINAL STABILITY



SYMBOL ◆ ▲ ◻	MACH	PARAMETRIC VALUES			
	0.596	BETA	0.000	RUDDER	0.000
	0.697	RUDDLR	30.000		
	1.194				
	1.956				
	3.480				
DATA HIST. CODE *GGC*G					

REFERENCE INFORMATION		
SREF	14.6836	sq. in.
LREF	4.5080	in.
BREF	5.6550	in.
XMRP	1.4621	in.
YMRP	0.0000	in.
ZMRP	0.0000	in.
SCALE	0.0034	

LONGITUDINAL STABILITY

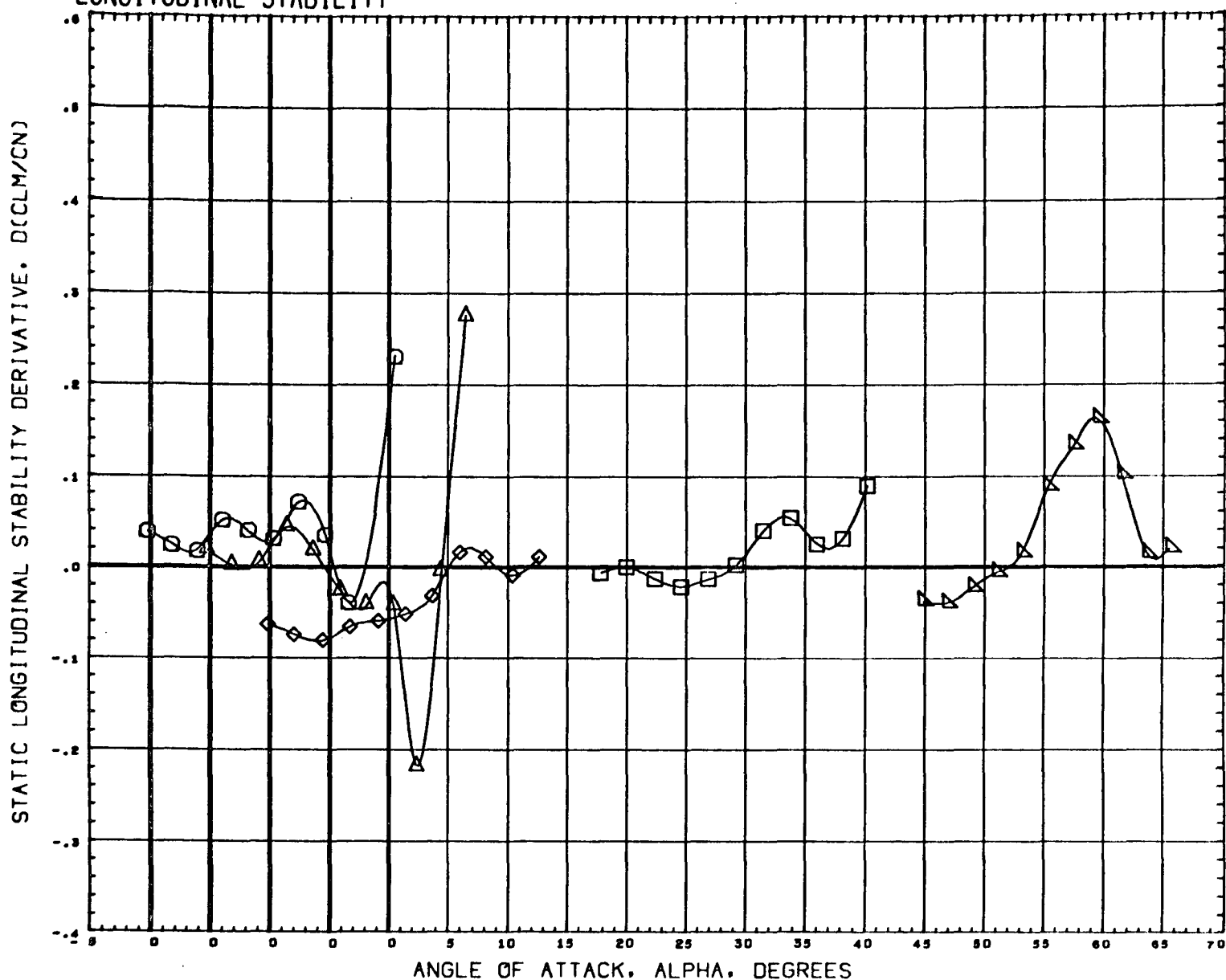


SYMBOL	MACH	BETA	PARAMETRIC VALUES	RUDDER
◇	0.598	0.000	30.000	0.000
△	0.697	0.000	30.000	0.000
○	1.194	0.000	30.000	0.000
□	1.996	0.000	30.000	0.000
◇	3.480	0.000	30.000	0.000

DATA HIST. CODE #GGC#G

REFERENCE INFORMATION		
SREF	14.6636	89. IN.
LREF	4.5060	IN.
BREF	9.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY



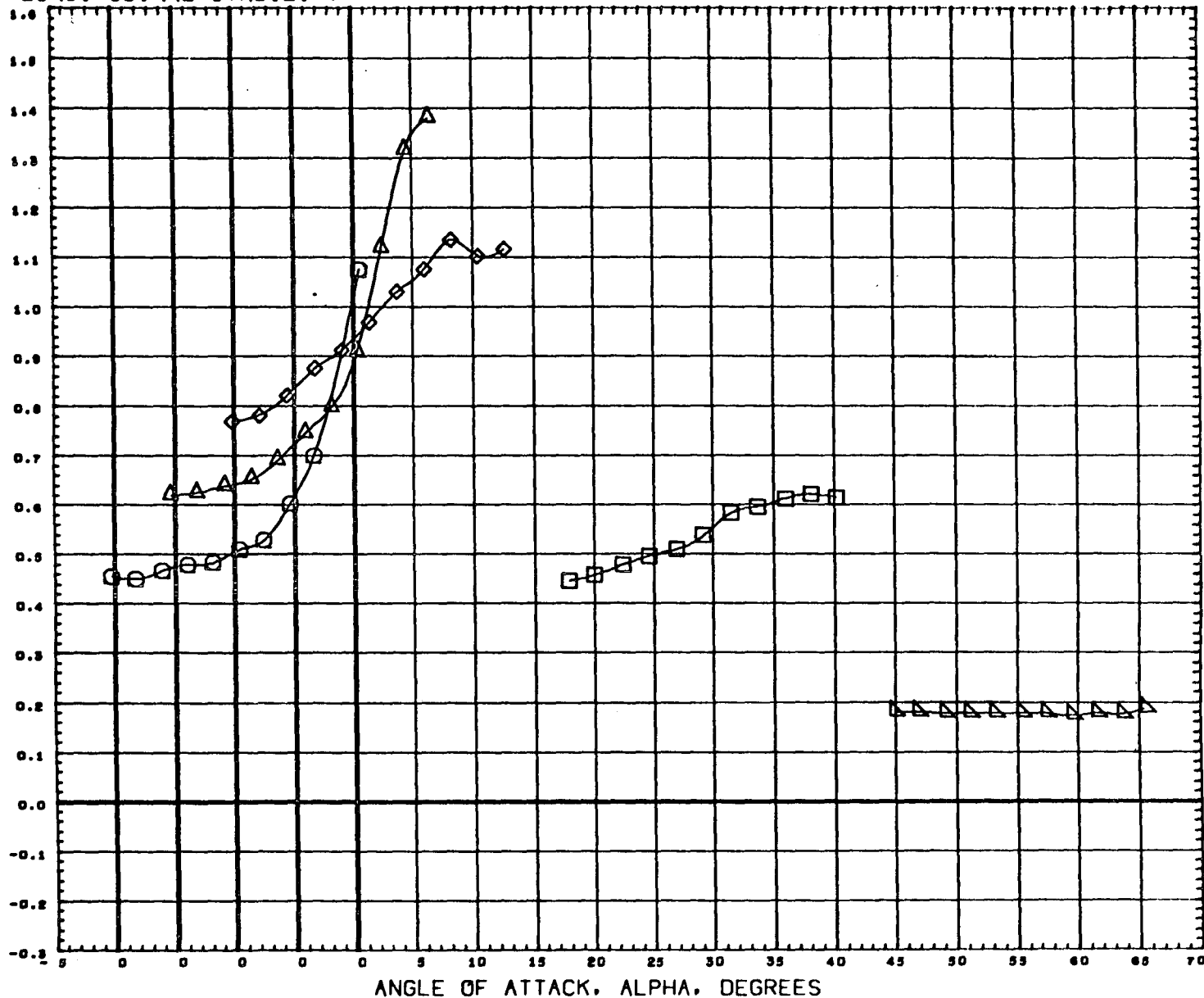
SYMBOL	MACH	PARAMETRIC VALUES			
○	0.598	BETA	0.000	RUDDER	0.000
△	0.897	RUDFLR	30.000		
◇	1.194				
□	1.936				
	3.480				

DATA HIST. CODE *GGC*G

REFERENCE INFORMATION		
SREF	14.6636	39. IN.
LREF	4.9060	IN.
BREF	3.6550	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY

AVERAGE BASE PRESSURE COEFFICIENT, CPB (AVG)



ANGLE OF ATTACK, ALPHA, DEGREES

SYMBOL	MACH	BETA	PARAMETRIC VALUES	RUDDER	
○	0.997	0.000	0.000	0.000	
◇	1.194	30.000			
◇	1.956				
△	3.480				

DATA HIST. CODE *66C*6

REFERENCE INFORMATION		
SREF	14.6836	80. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

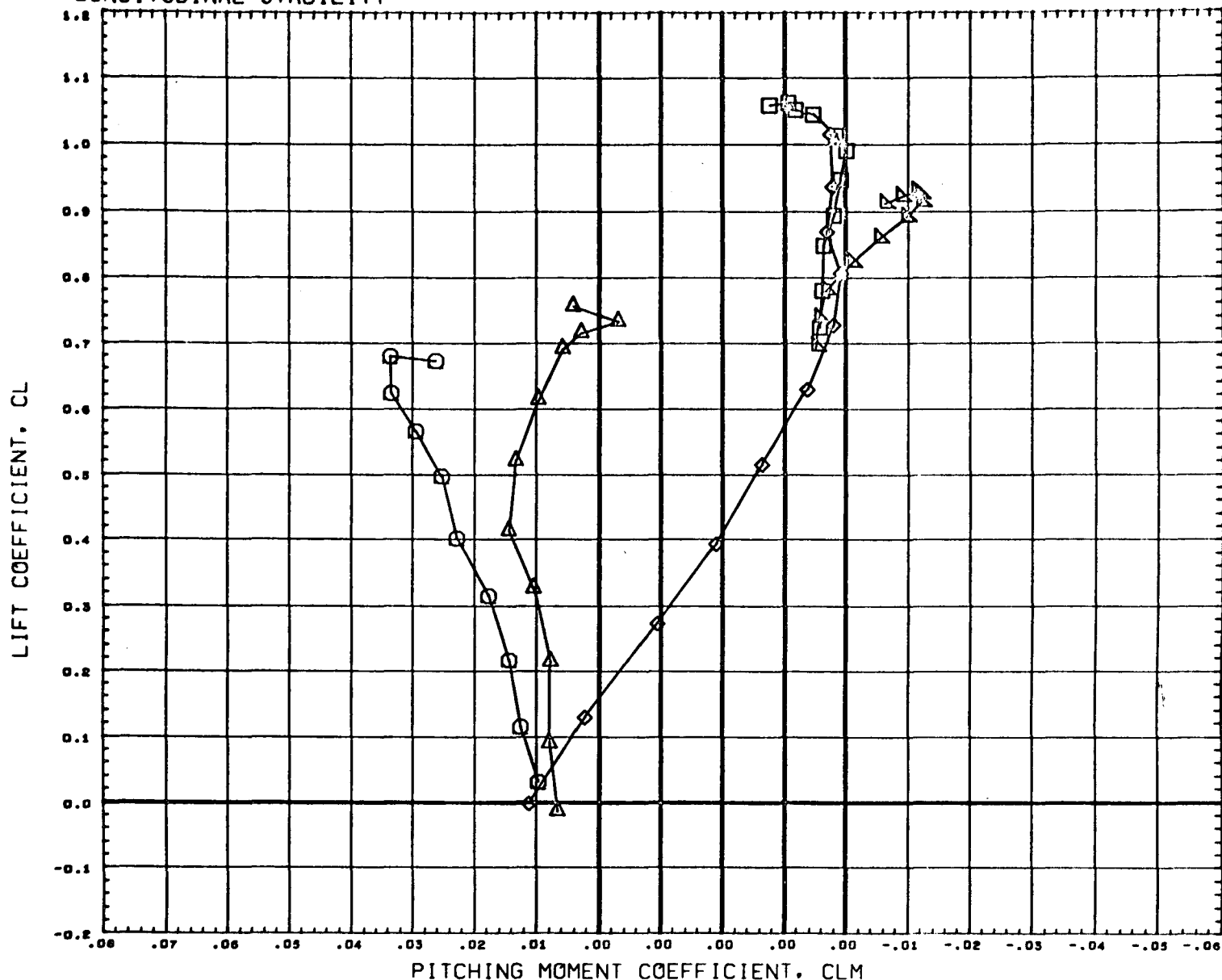
M513-MSFC MODELAR12161-2

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LONGITUDINAL STABILITY



SYMBOL MACH
 0.598 BETA 0.000 RUDDER 0.000
 0.897 RUDFLR 30.000
 1.194
 1.936
 3.480

PARAMETRIC VALUES
 0.000 RUDDER 0.000
 30.000

REFERENCE INFORMATION
 SREF 14.6836 50. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE *GGC*G

M513-MSFC MODELAR12161-2

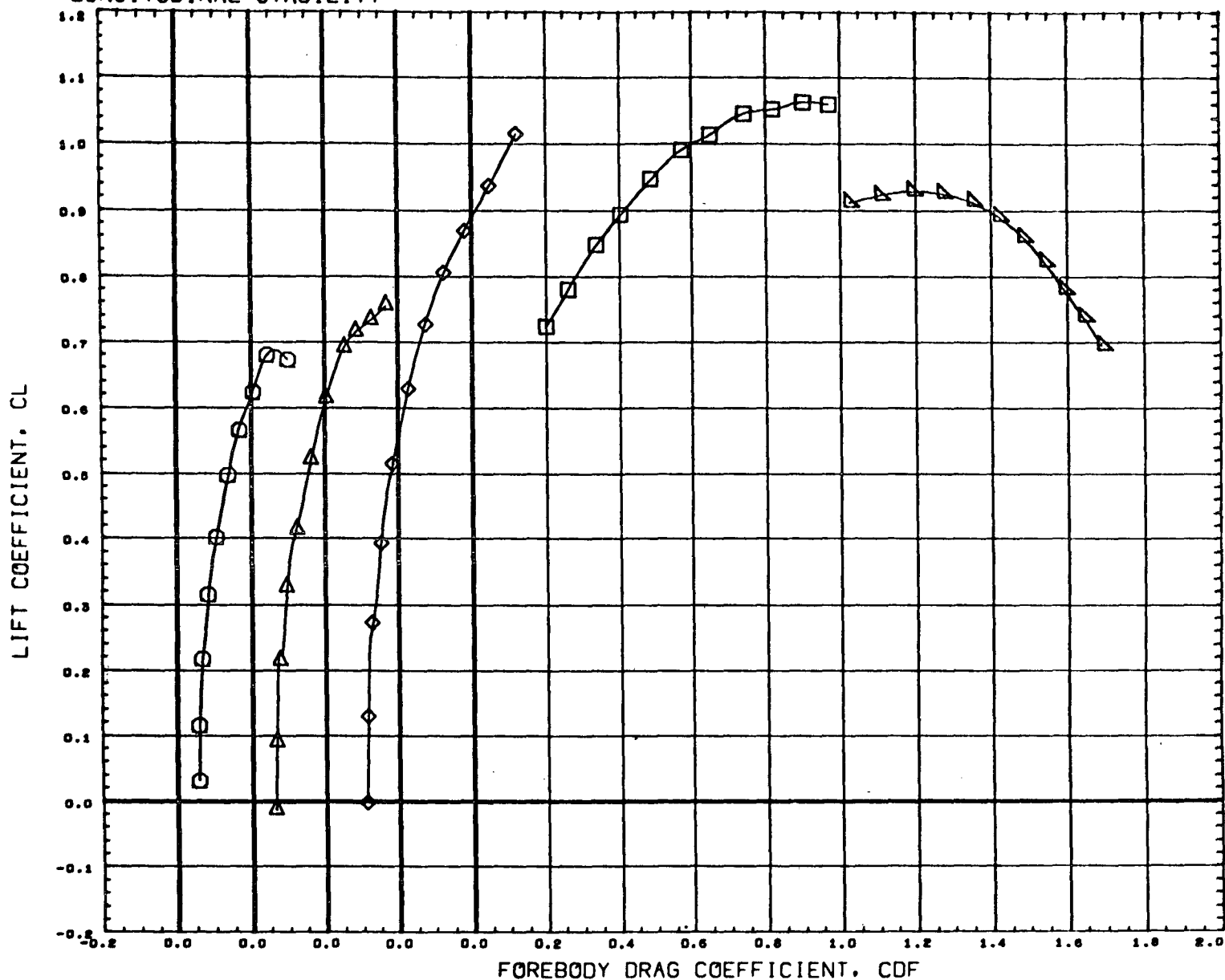
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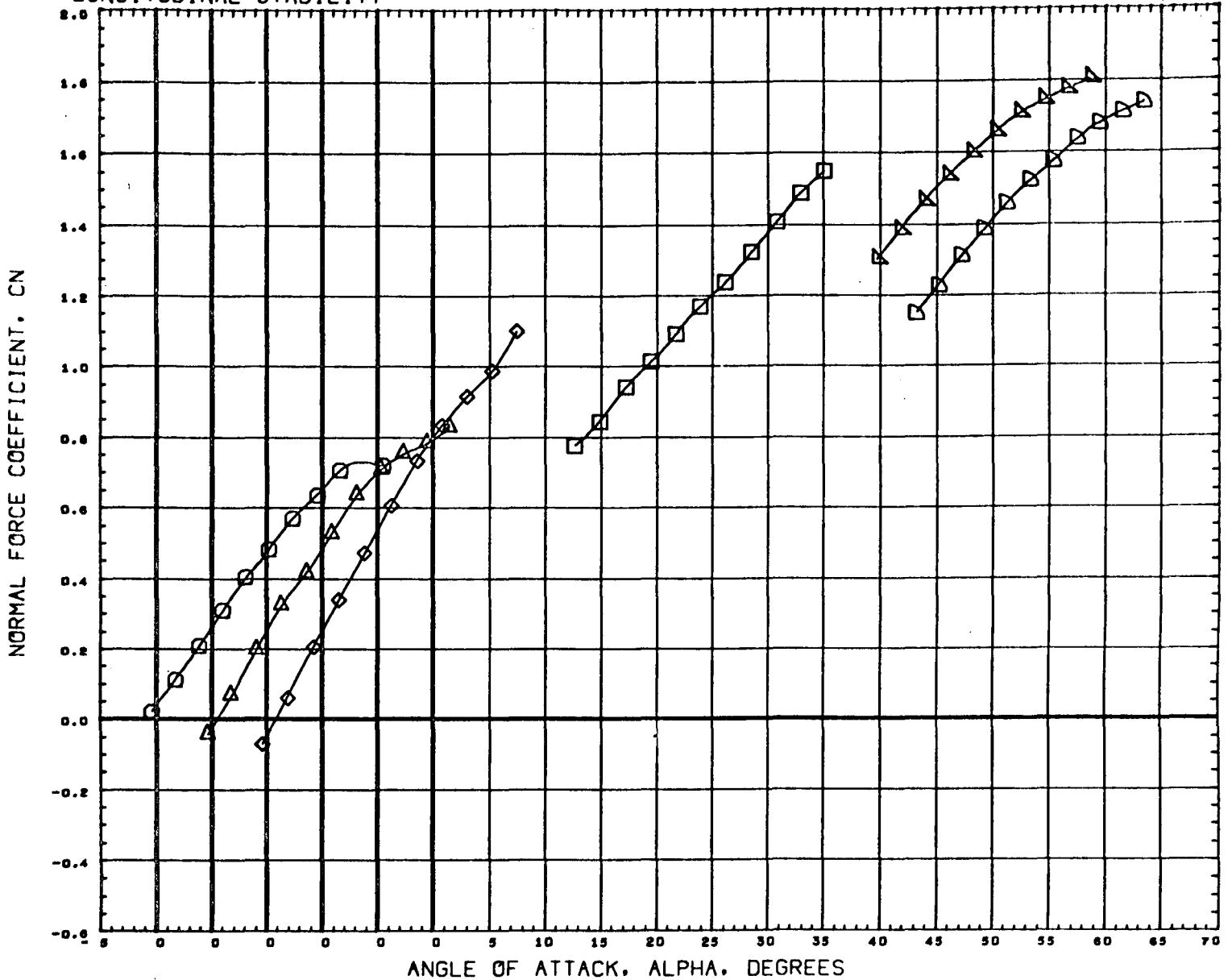
LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			REFERENCE INFORMATION		
○	0.598	BETA	0.000	RUDDER	0.000	SREF	14.6636
△	0.697	RUDFLR	30.000			LREF	4.5000
◇	1.194					BREF	5.6550
□	1.936					XNRP	1.4621
■	3.480					YNRP	0.0000
						ZNRP	0.0000
						SCALE	0.0034

DATA MIST. CODE *GGC*G

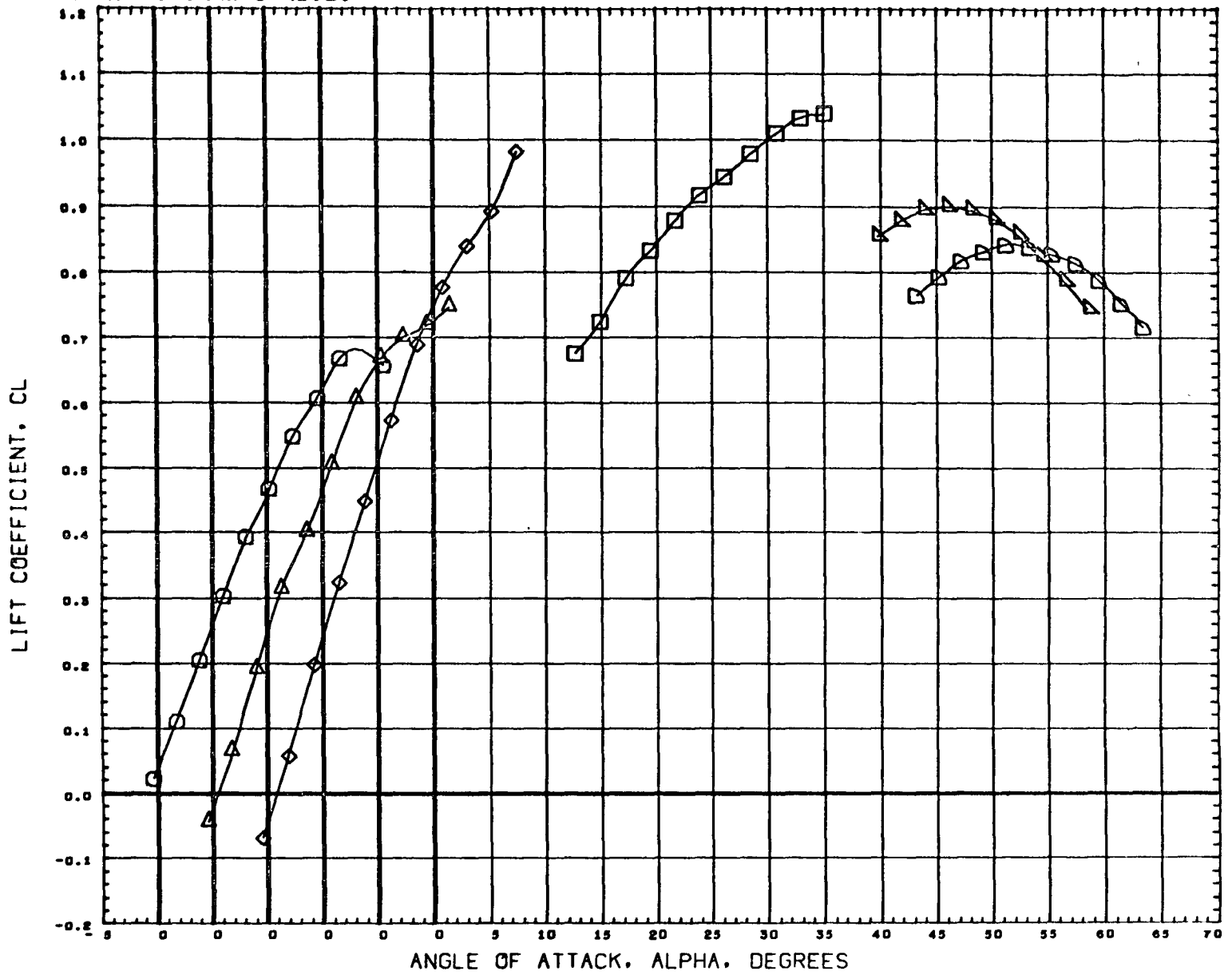
LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
○	0.994	BETA	0.000	RUDDER
△	0.903	RUDDLR	30.000	0.000
◇	1.198			
□	1.956			
	3.480			
	4.959	DATA HIST. CODE	*66C*6	

REFERENCE INFORMATION		
SREF	14.6836	50. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

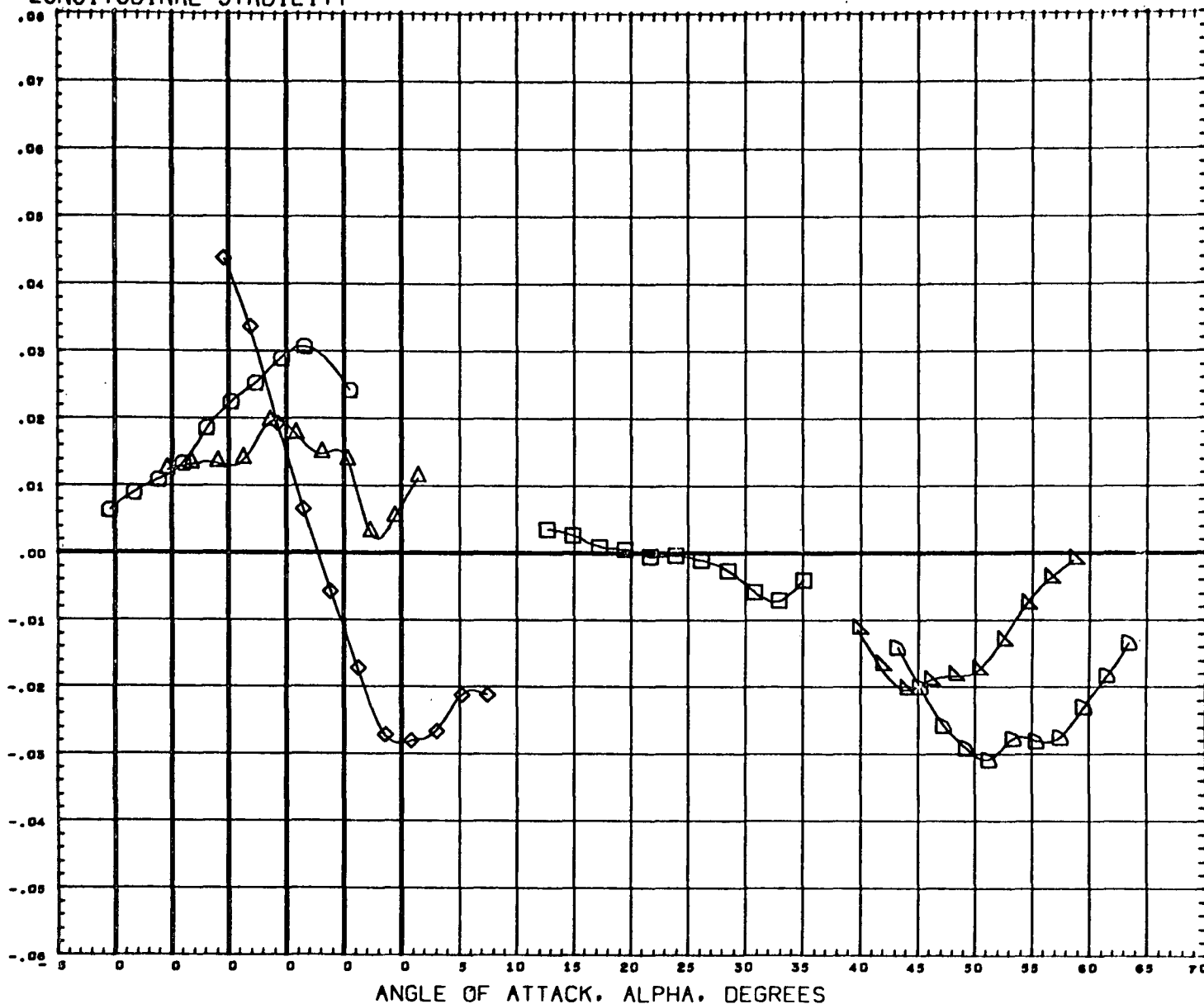
LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES				REFERENCE INFORMATION		
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◇	0.903	RUDDL	30.000			LREF	4.5080	IN.
△	1.196					SREF	5.6550	IN.
□	1.956					XMRP	1.4821	IN.
▽	3.480					YMRP	0.0000	IN.
◇	4.959	DATA HIST. CODE	#GGC#G			ZMRP	0.0000	IN.
						SCALE	0.0034	

LONGITUDINAL STABILITY

PITCHING MOMENT COEFFICIENT, CLM

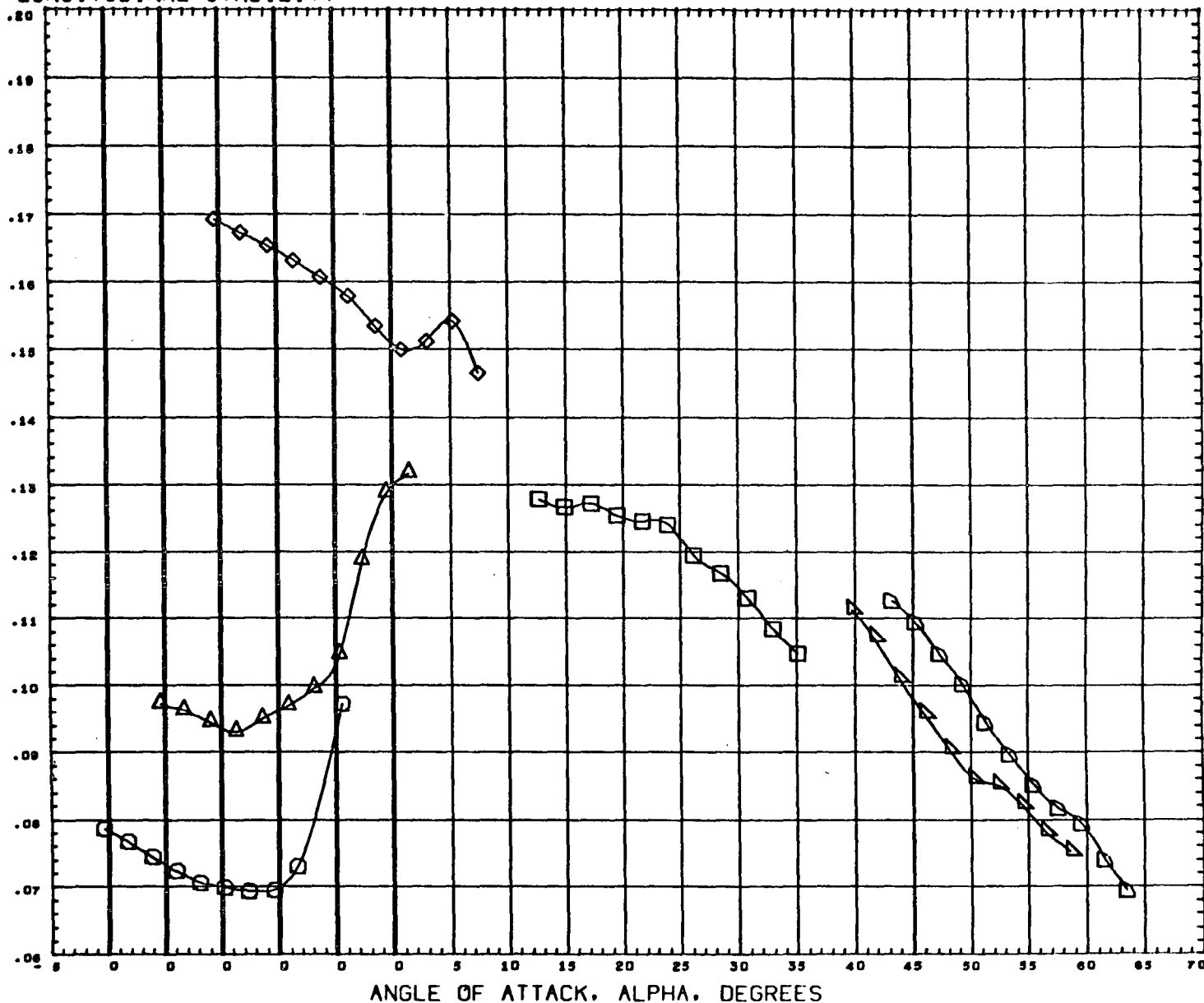


SYMBOL	MACH	PARAMETRIC VALUES			
○	0.594	BETA	0.000	RUDDER	0.000
△	0.903	RUDDLR	30.000		
◇	1.196				
□	1.956				
◇	3.480				
□	4.959	DATA HIST. CODE	*GGC*G		

REFERENCE INFORMATION		
SREF	14.6836	80. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

AXIAL FORCE CORRECTED TO FREE STREAM PRESSURE AT THE BASE REGION. CAT

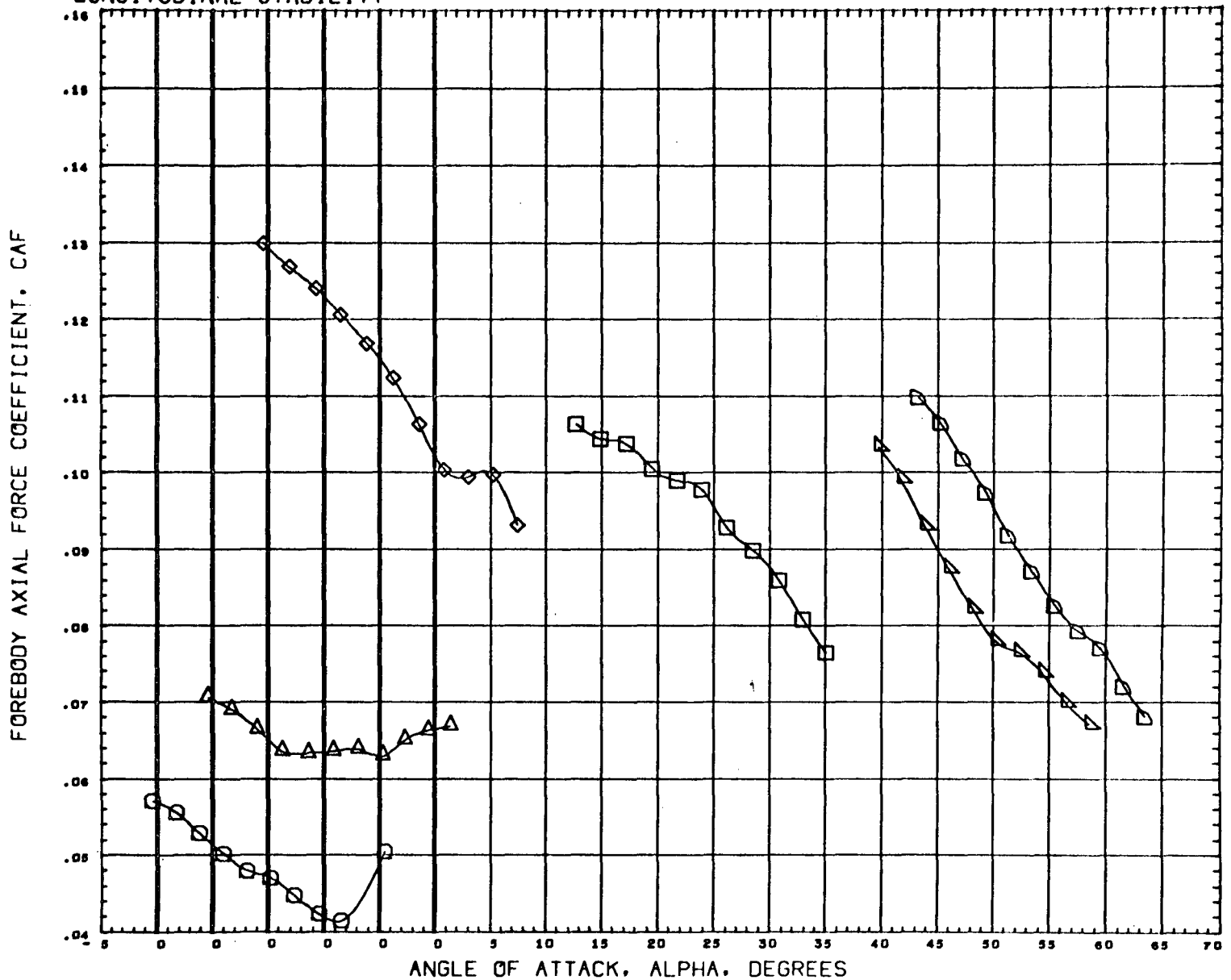
LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	0.994	BETA	0.000	RUDDER	0.000
△	0.903	RUDDLR	30.000		
□	1.196				
	1.958				
	3.460				
	4.959	DATA HIST. CODE	#GGC*G		

REFERENCE INFORMATION		
SREF	14.6836	89. IN.
LREF	4.5060	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY

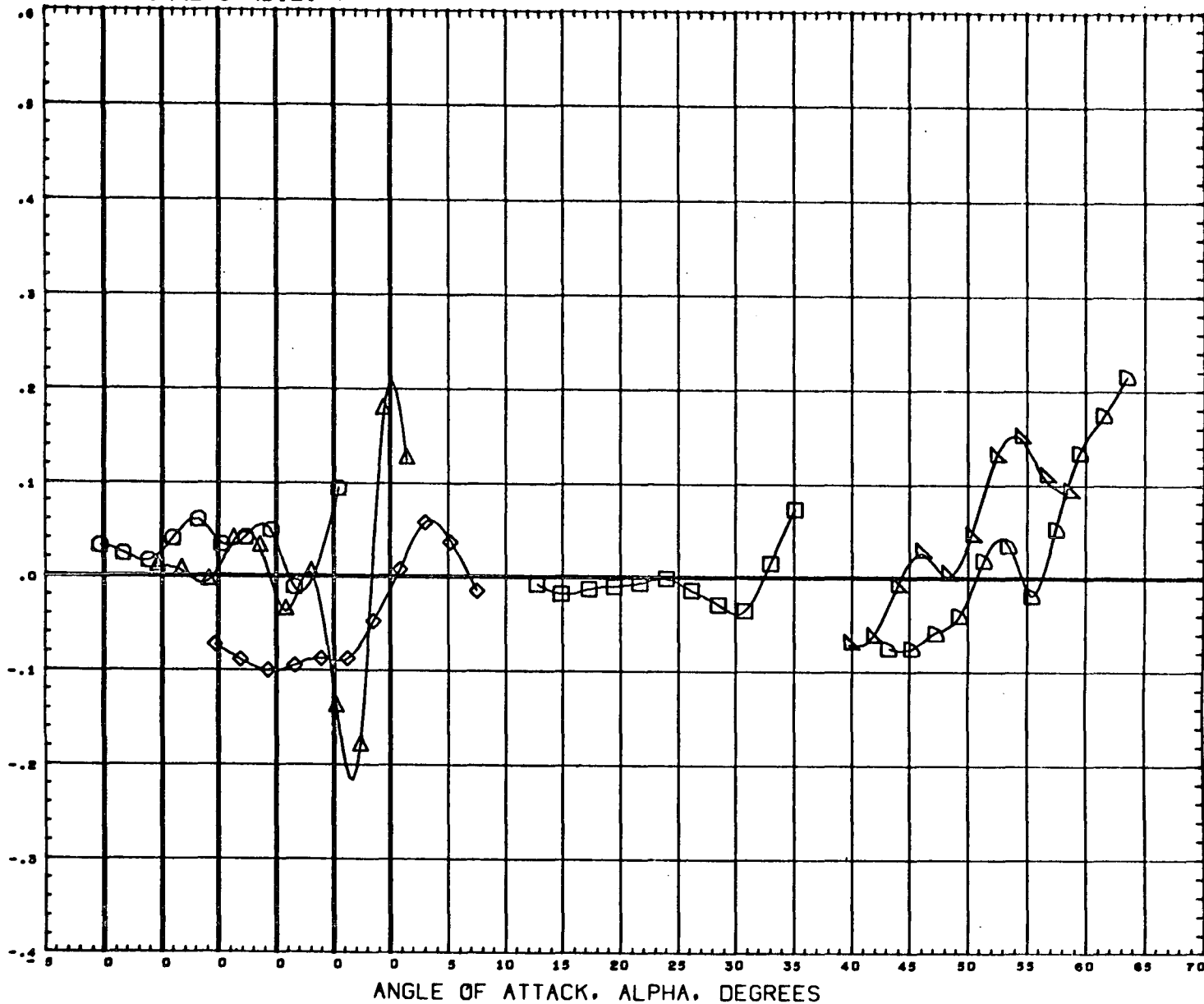


SYMBOL	MACH	PARAMETRIC VALUES		
○	0.594	BETA	0.000	RUDDER
△	0.903	RUDFLR	30.000	0.000
◇	1.198			
□	1.958			
◇	3.480			
◇	4.958	DATA HIST. CODE	#GGC#G	

REFERENCE INFORMATION		
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LREF	4.9080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY

STATIC LONGITUDINAL STABILITY DERIVATIVE, $D(C_{LM}/C_N)$

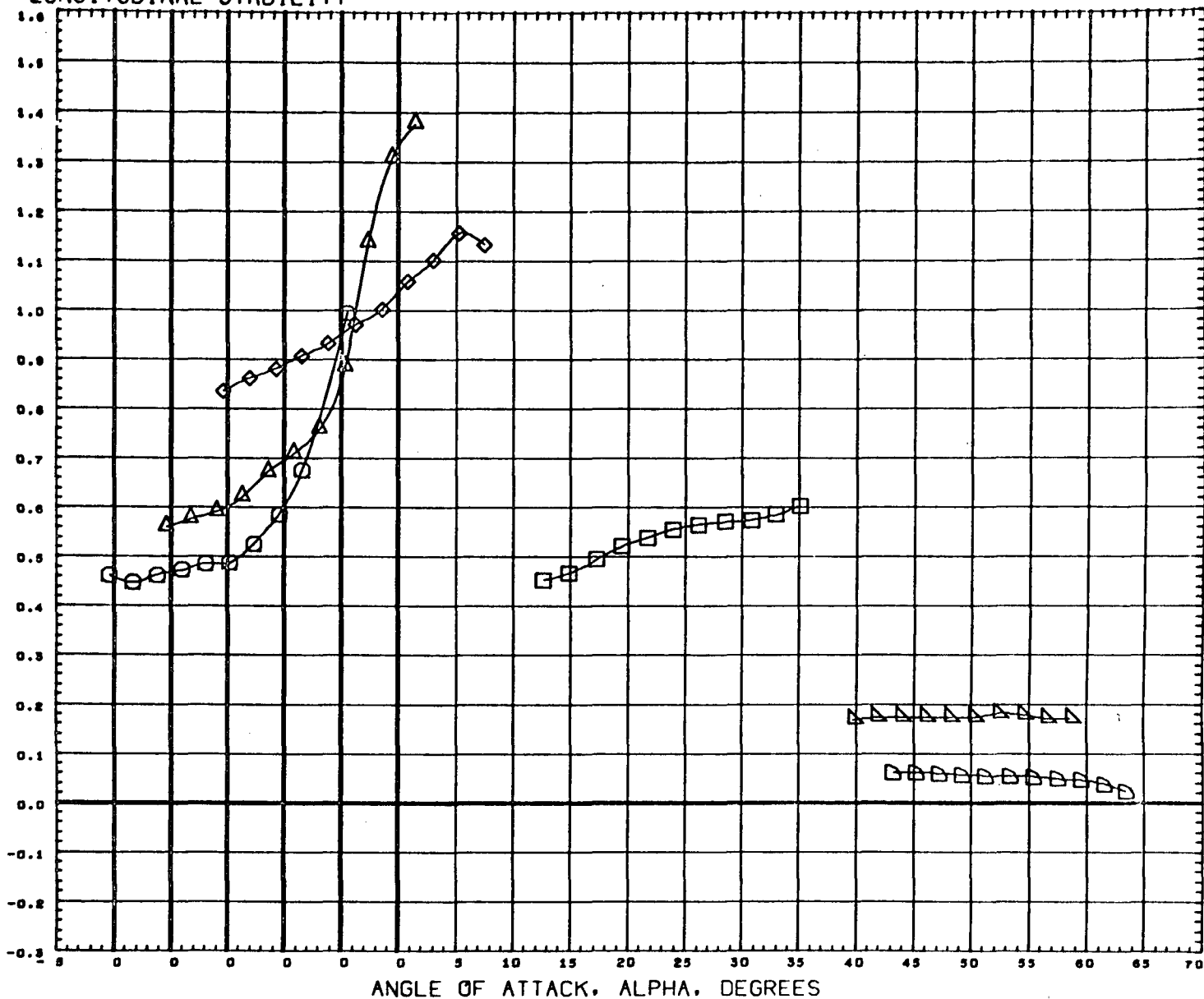


SYMBOL	MACH	PARAMETRIC VALUES		
○	0.594	BETA	0.000	RUDDER
△	0.903	RUDDLR	30.000	0.000
□	1.198			
◇	1.938			
	3.480			
	4.938	DATA HIST. CODE	*GGC*G	

REFERENCE INFORMATION		
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LREF	4.5080	IN.
BREF	9.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY

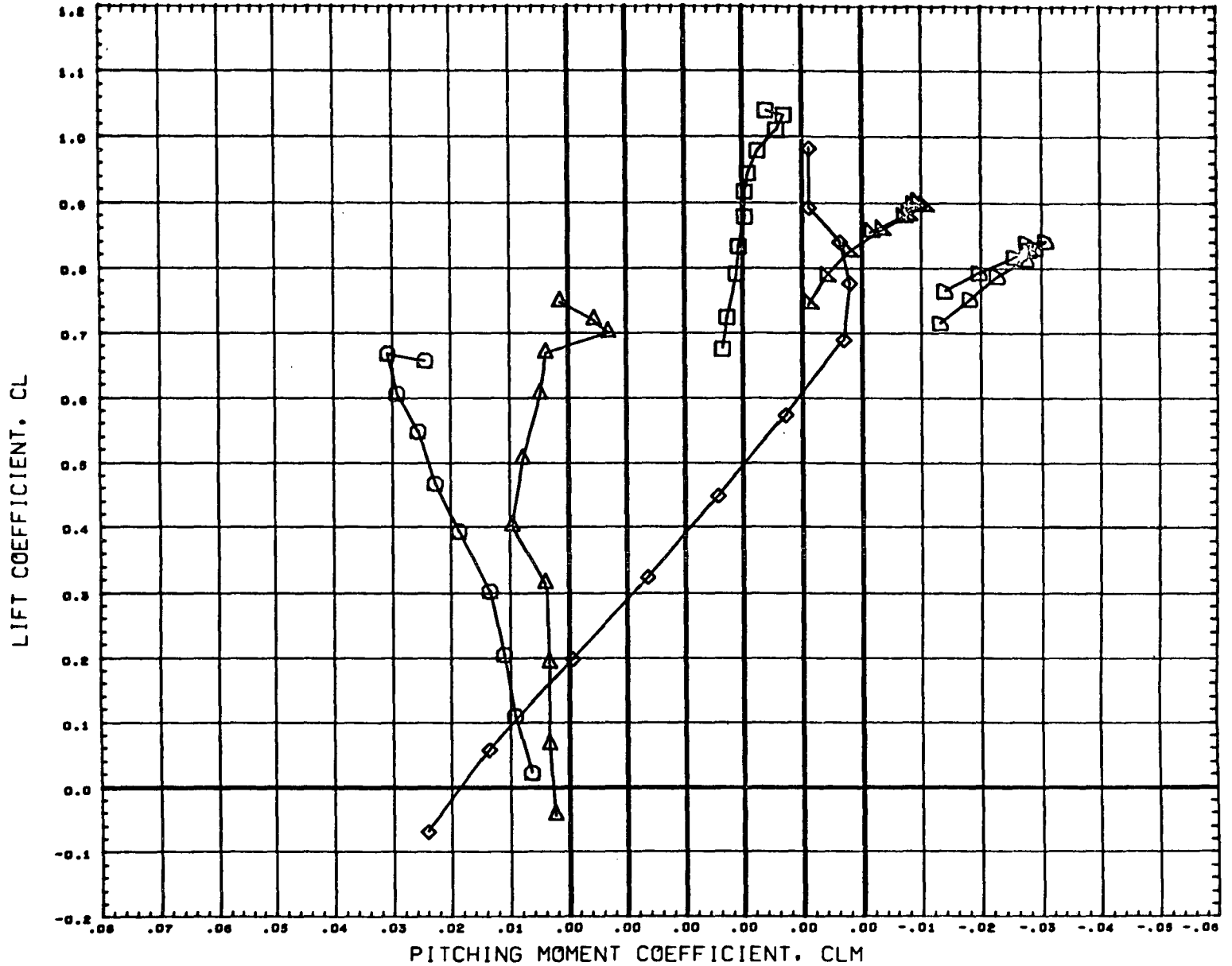
AVERAGE BASE PRESSURE COEFFICIENT, CPB (AVG)



SYMBOL ○ ◻ ◻ ◻ ◻	MACH	PARAMETRIC VALUES			
	0.594	BETA	0.000	RUDDER	0.000
	0.903	RUDDLR	30.000		
	1.198				
	1.958				
	3.480				
	4.959	DATA HIST. CODE	#GGC#G		

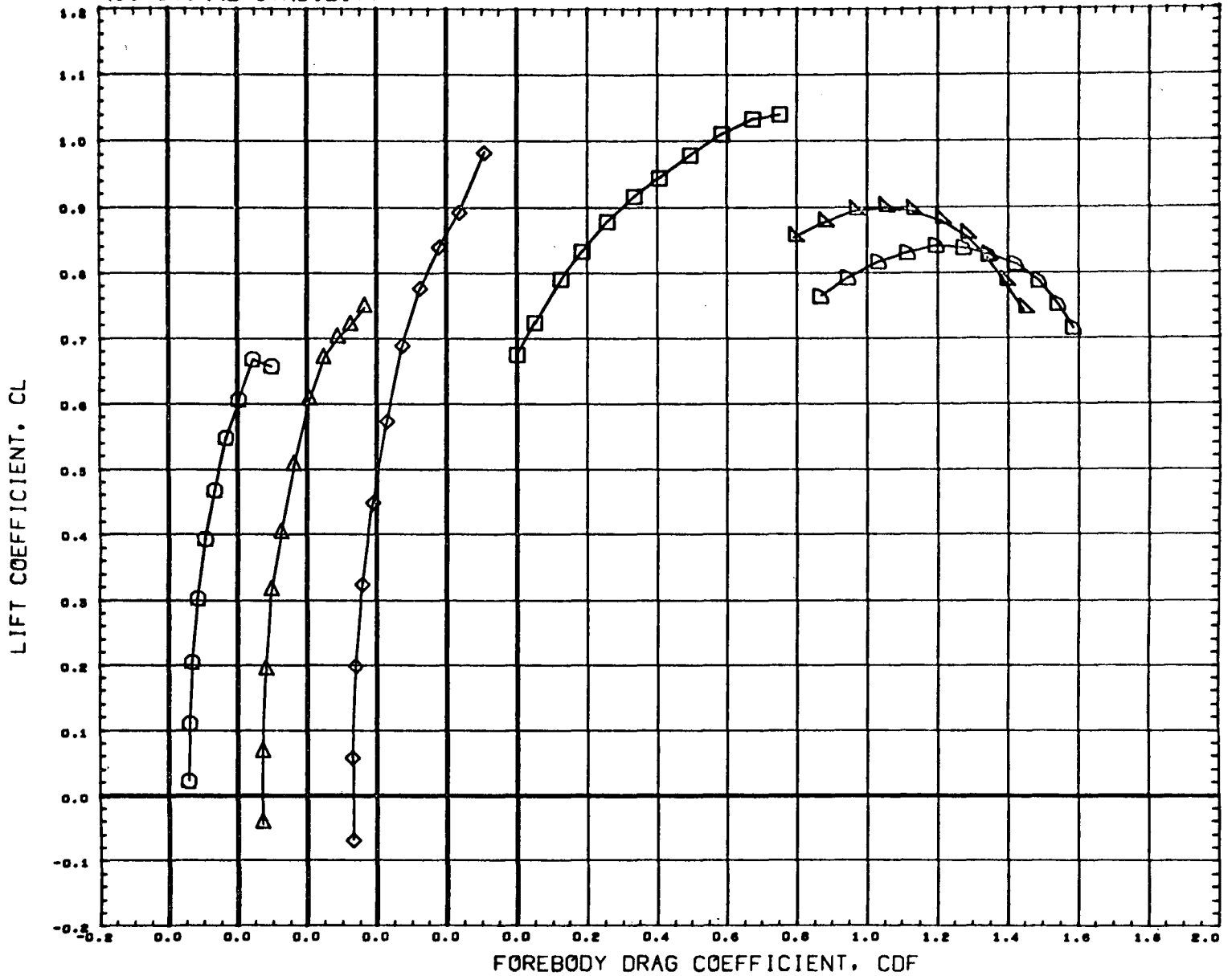
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LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			REFERENCE INFORMATION		
○	0.994	BETA	0.000	RUDDER	0.000	SREF	14.6636 80. IN.
□	0.903	RUDFLR	30.000			LREF	4.5060 IN.
◇	1.198					BREF	5.6350 IN.
△	1.958					XMRP	1.4821 IN.
□	3.480					YMRP	0.0000 IN.
◇	4.959	DATA HIST. CODE	*GGC*G			ZMRP	0.0000 IN.
						SCALE	0.0034

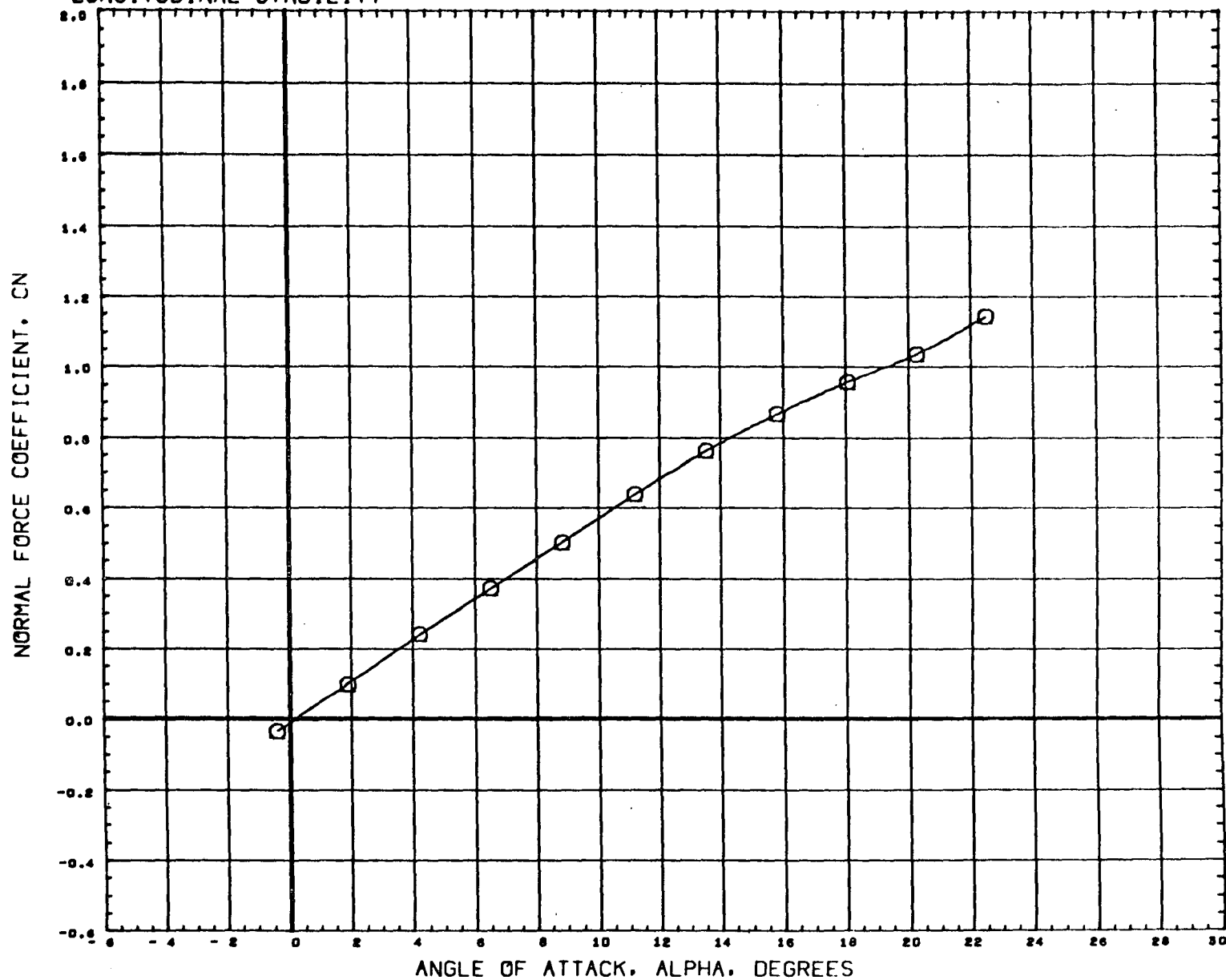
LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
○	0.994	BETA	0.000	RUDDER
△	0.903	RUDDLR	30.000	0.000
◇	1.196			
□	1.956			
☆	3.460			
	4.959	DATA HIST. CODE	*GGC*G	

REFERENCE INFORMATION		
SREF	14.6636	89. IN.
LREF	4.5060	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY



SYMBOL \bigcirc MACH 1.198
 BETA 0.000
 RUDFLR 30.000
 PARAMETRIC VALUES
 RUDDER 0.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

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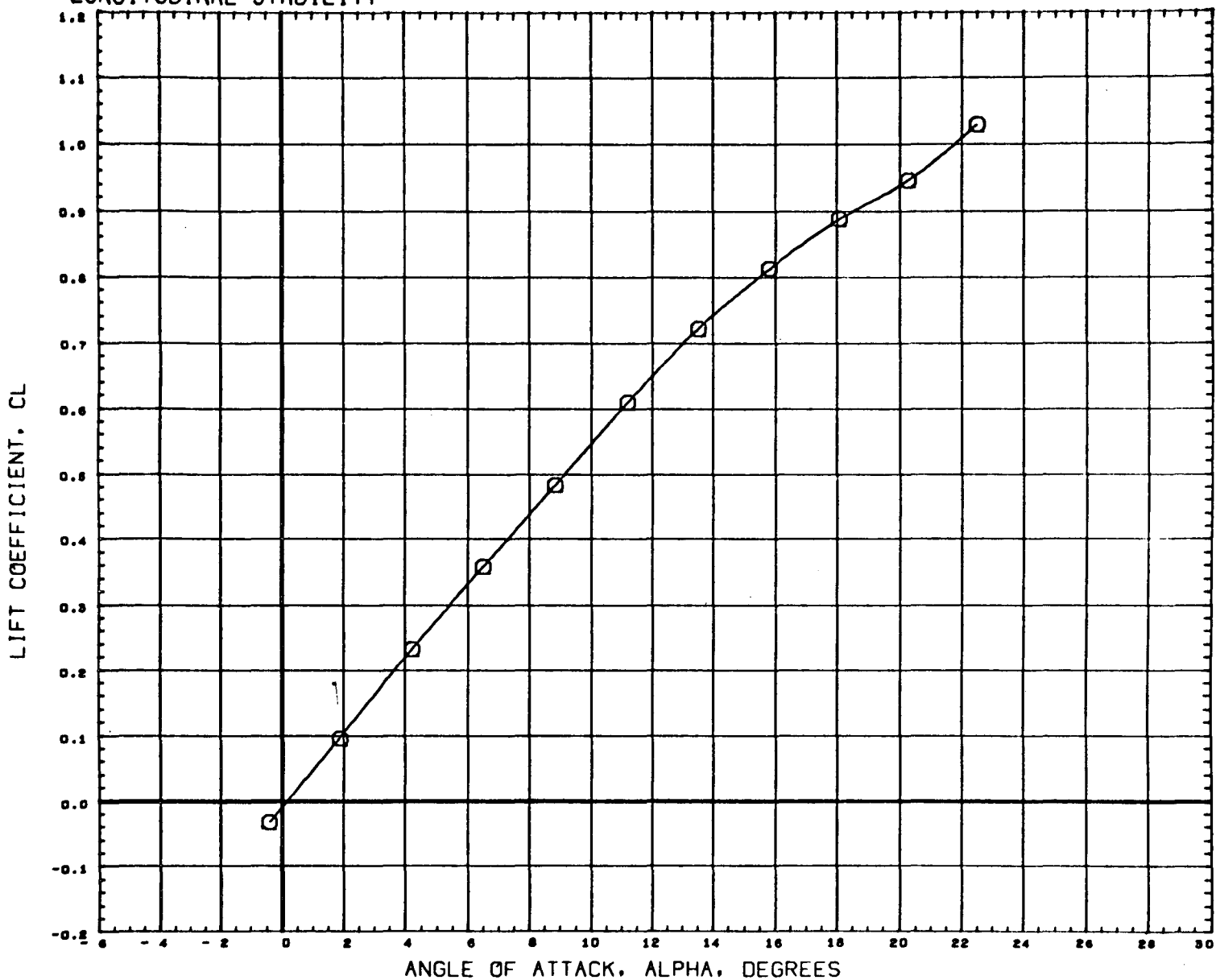
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LONGITUDINAL STABILITY



SYMBOL \bigcirc MACH 1.198 BETA 0.000 RUDDER 0.000
PARAMETRIC VALUES
RUDFLR 30.000

REFERENCE INFORMATION
SREF 14.6836 88. IN.
LREF 4.5080 IN.
BREF 3.6550 IN.
XMRP 1.4821 IN.
YMRP 0.0000 IN.
ZMRP 0.0000 IN.
SCALE 0.0034

DATA HIST. CODE GC

M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E2

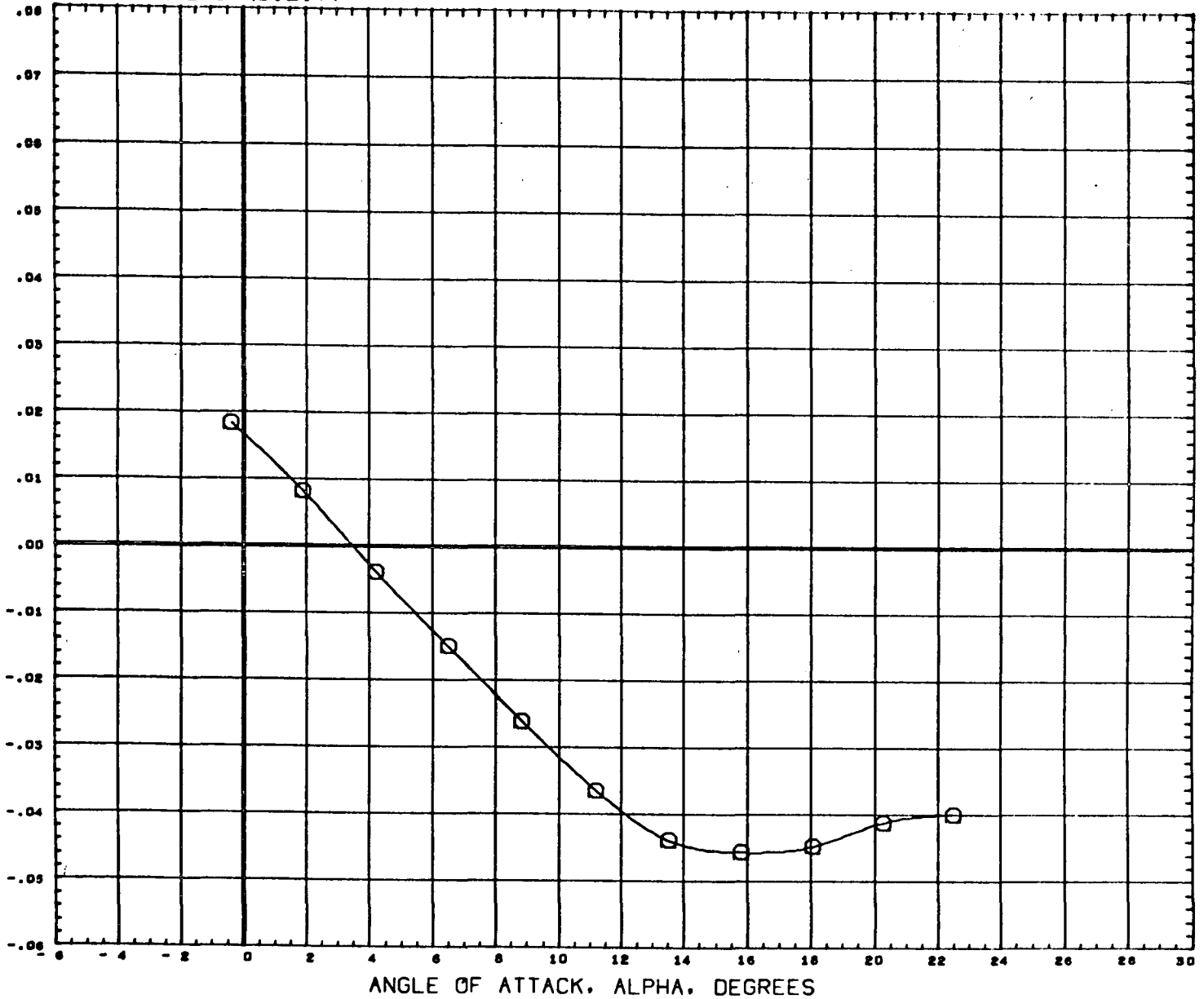
(C5322A) 18 MAR 72

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LONGITUDINAL STABILITY

PITCHING MOMENT COEFFICIENT, CLM



SYMBOL \square MACH 1.198
 BETA 0.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 98. IN.
 LREF 4.3080 IN.
 BREF 5.4550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
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 SCALE 0.0034

DATA HIST. CODE GC

M513-MSFC MODELAR12161-2

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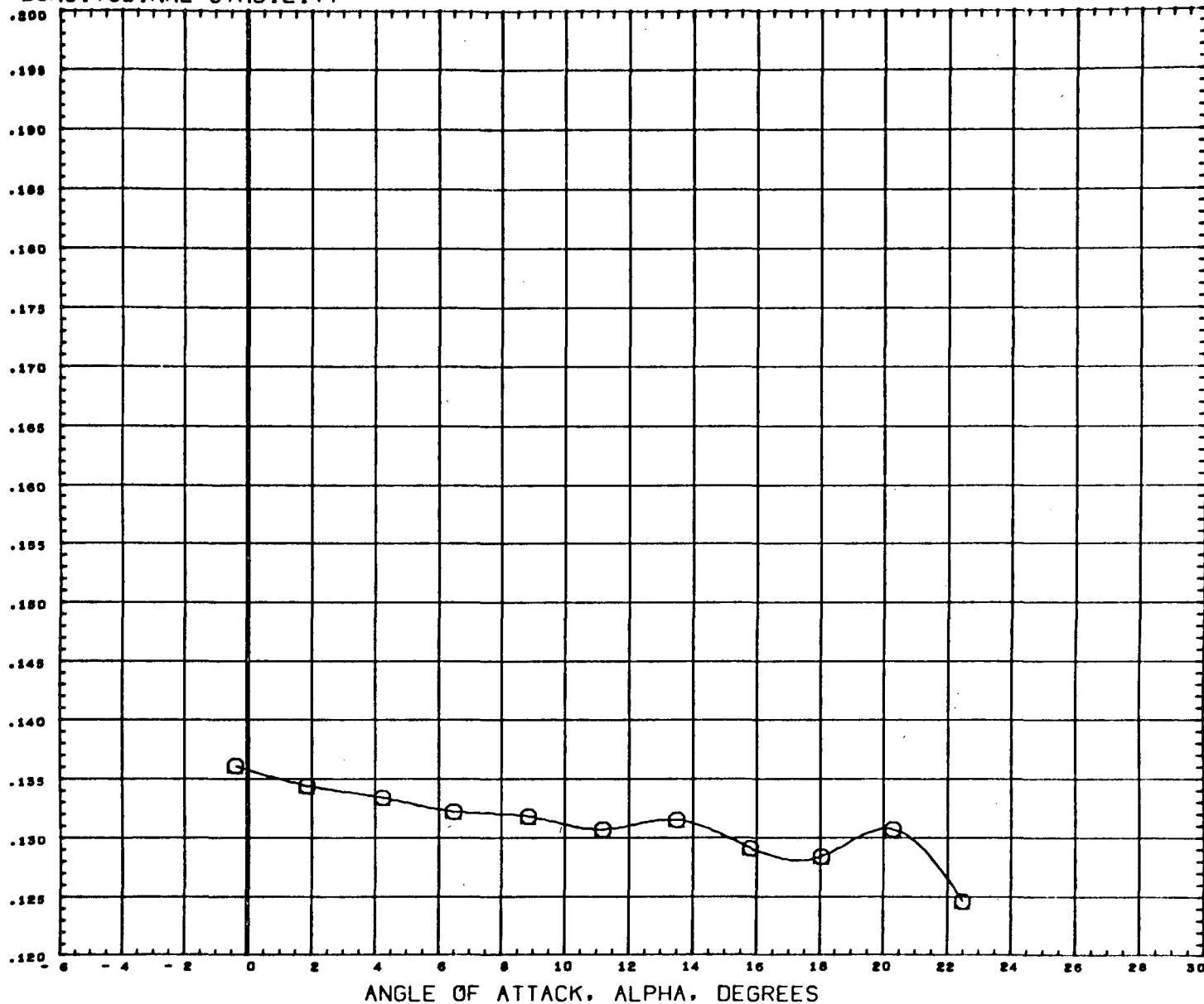
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LONGITUDINAL STABILITY

AXIAL FORCE CORRECTED TO FREE STREAM PRESSURE AT THE BASE REGION. CAT



ANGLE OF ATTACK, ALPHA, DEGREES

SYMBOL MACH 1.198 BETA 0.000 RUDDER 0.000
 O RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6636 89 IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XHRP 1.4821 IN.
 YHRP 0.0000 IN.
 ZHRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

M513-MSFC MODELAR1216I-2

B5CW11AF2S1V7E2

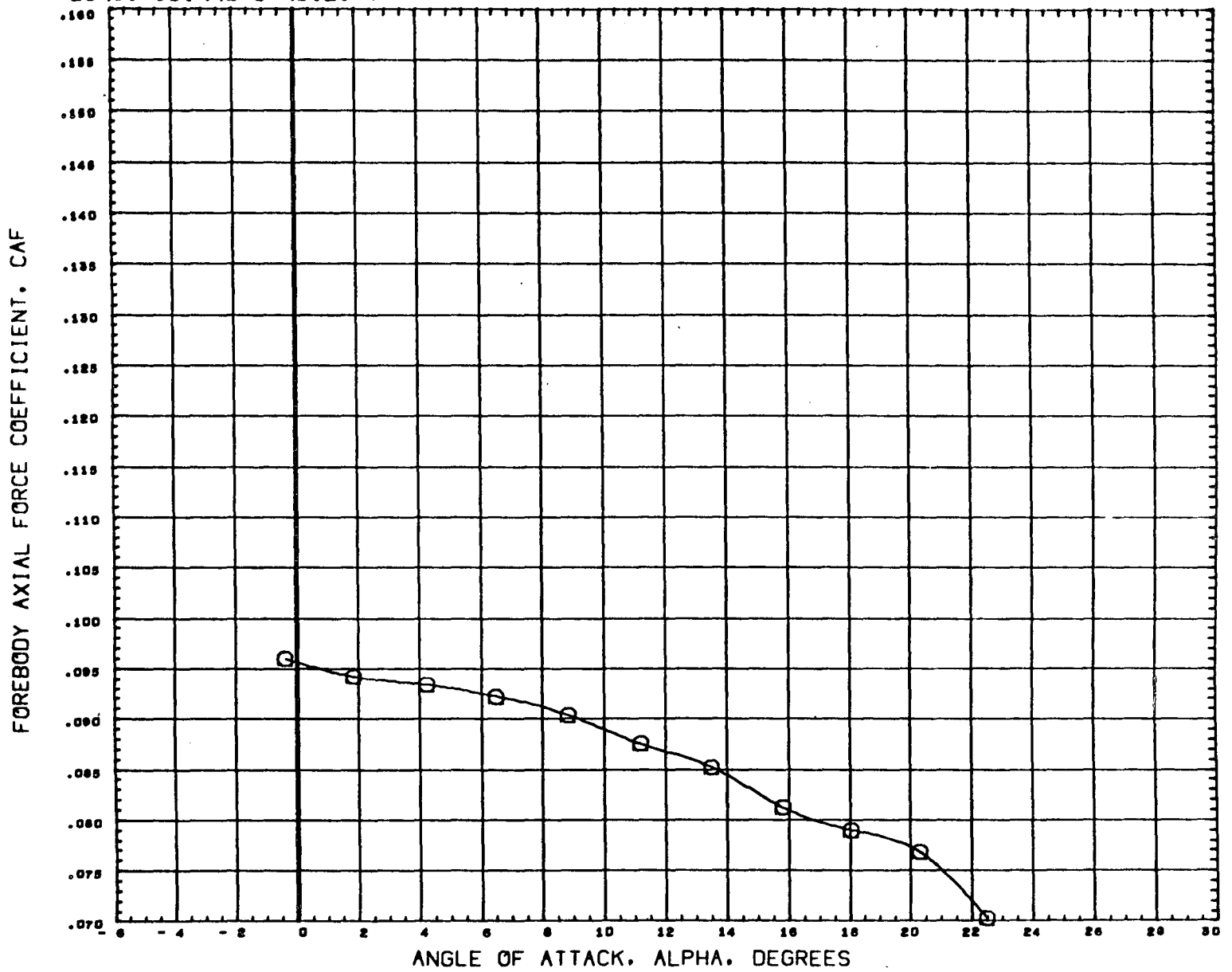
(C5322A)

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LONGITUDINAL STABILITY



SYMBOL \square MACH 1.198 BETA 0.000 RUDDER 0.000
 RUDFLR 30.000

DATA HIST. CODE GC

REFERENCE INFORMATION
 SREF 14.6836 80 IN.
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 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
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 SCALE 0.0034

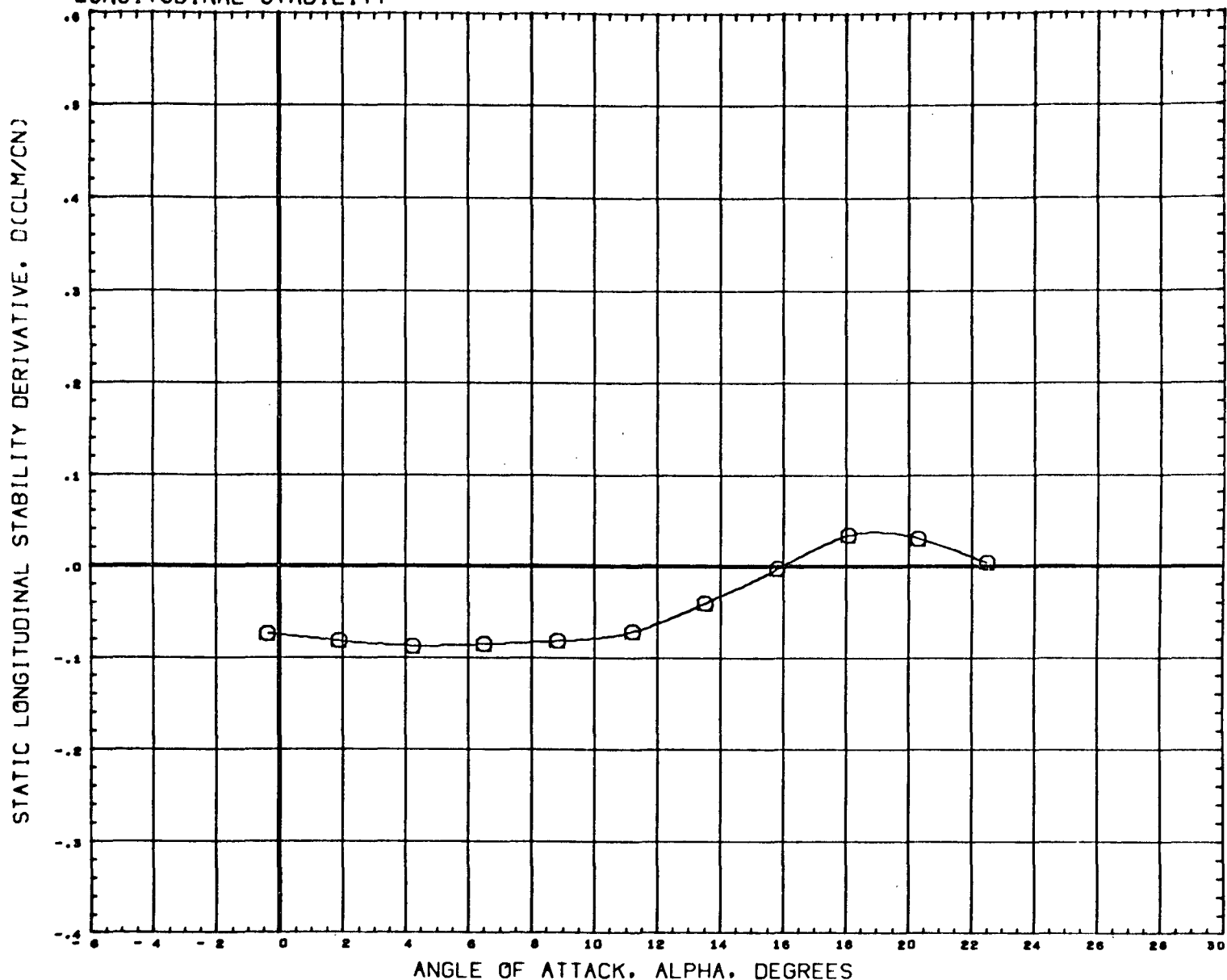
M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E2

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LONGITUDINAL STABILITY



SYMBOL \bigcirc MACH 1.198
 PARAMETRIC VALUES
 BETA 0.000 RUDDER 0.000
 RUDDLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 38. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

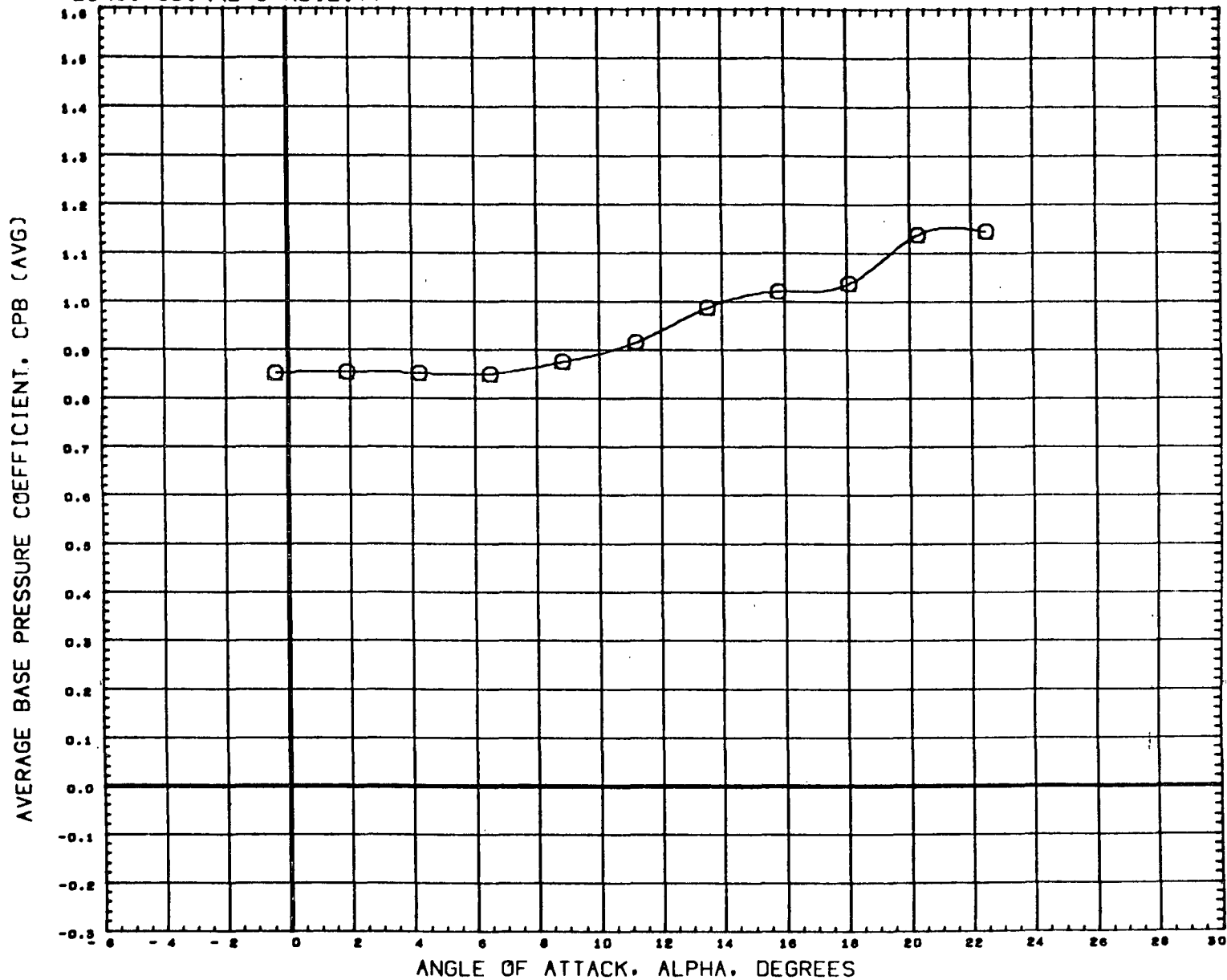
M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E2

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LONGITUDINAL STABILITY



SYMBOL \bigcirc MACH 1.196
 BETA 0.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6036 89 IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
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 SCALE 0.0034

DATA HIST. CODE GC

M513-MSFC MODELAR12161-2

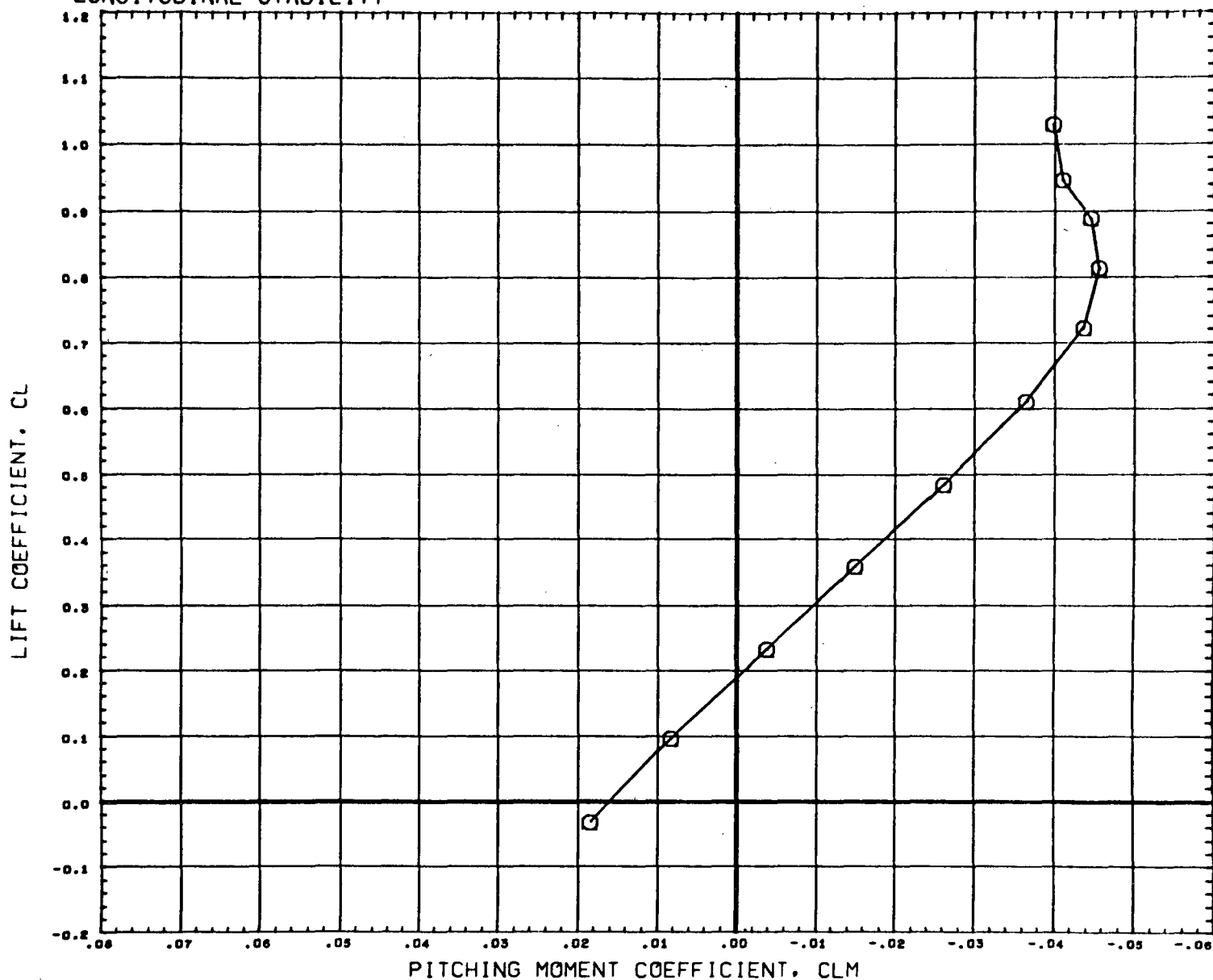
B5CW11AF2S1V7E2

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LONGITUDINAL STABILITY



SYMBOL \square MACH 1.198 BETA 0.000 RUDDER 0.000
 RUDFLR 30.000

DATA HIST. CODE 6C

REFERENCE INFORMATION
 SREF 14.6836 SQ. IN.
 LREF 4.5080 IN.
 BREF 3.6550 IN.
 XMRP 1.4821 IN.
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 ZMRP 0.0000 IN.
 SCALE 0.0034

M513-MSFC MODELAR1216I-2

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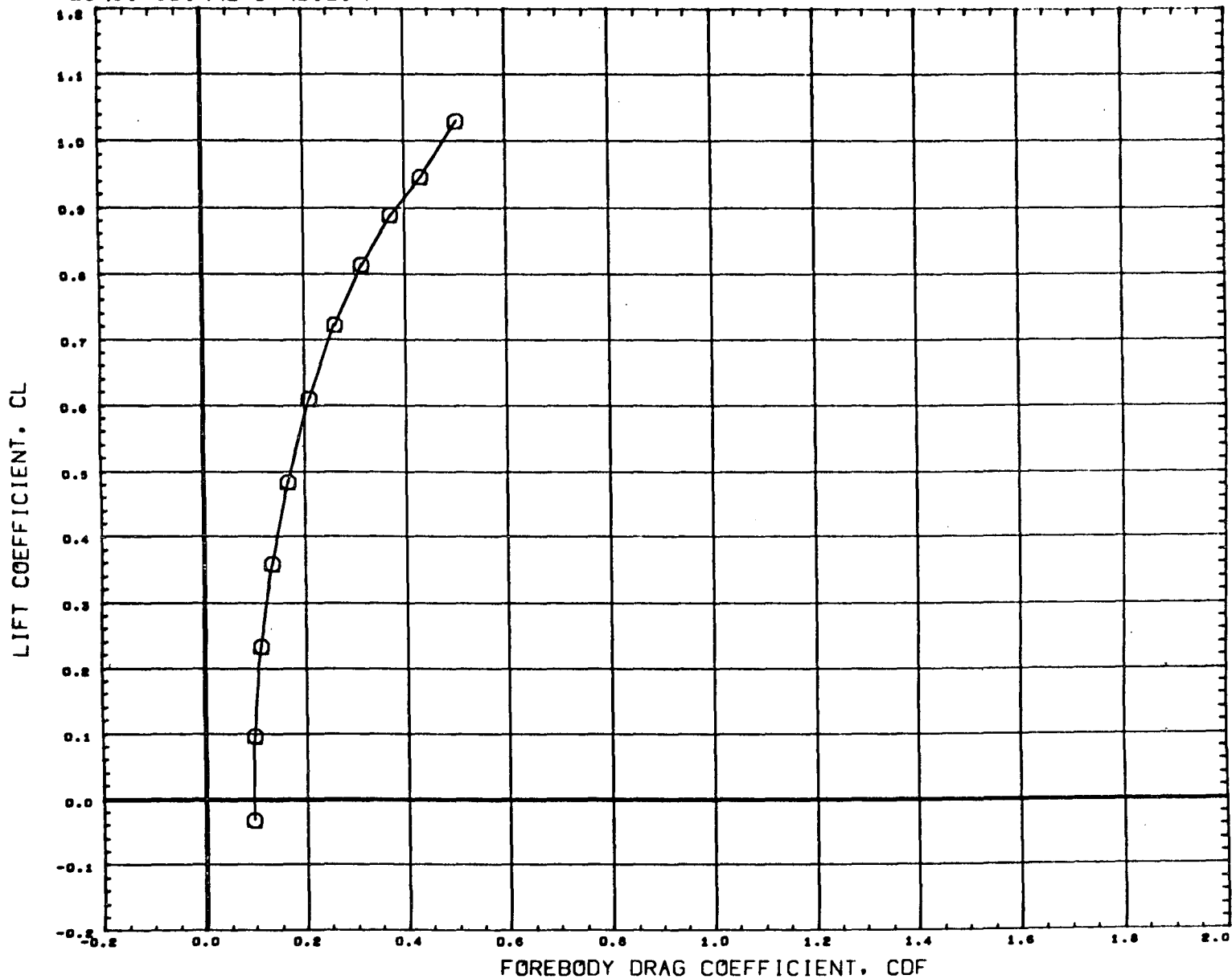
(C5322A)

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LONGITUDINAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 ○ 1.198 BETA 0.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 39. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
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 SCALE 0.0034

DATA HIST. CODE 6C

MS13-MSFC MODELAR1216I-2

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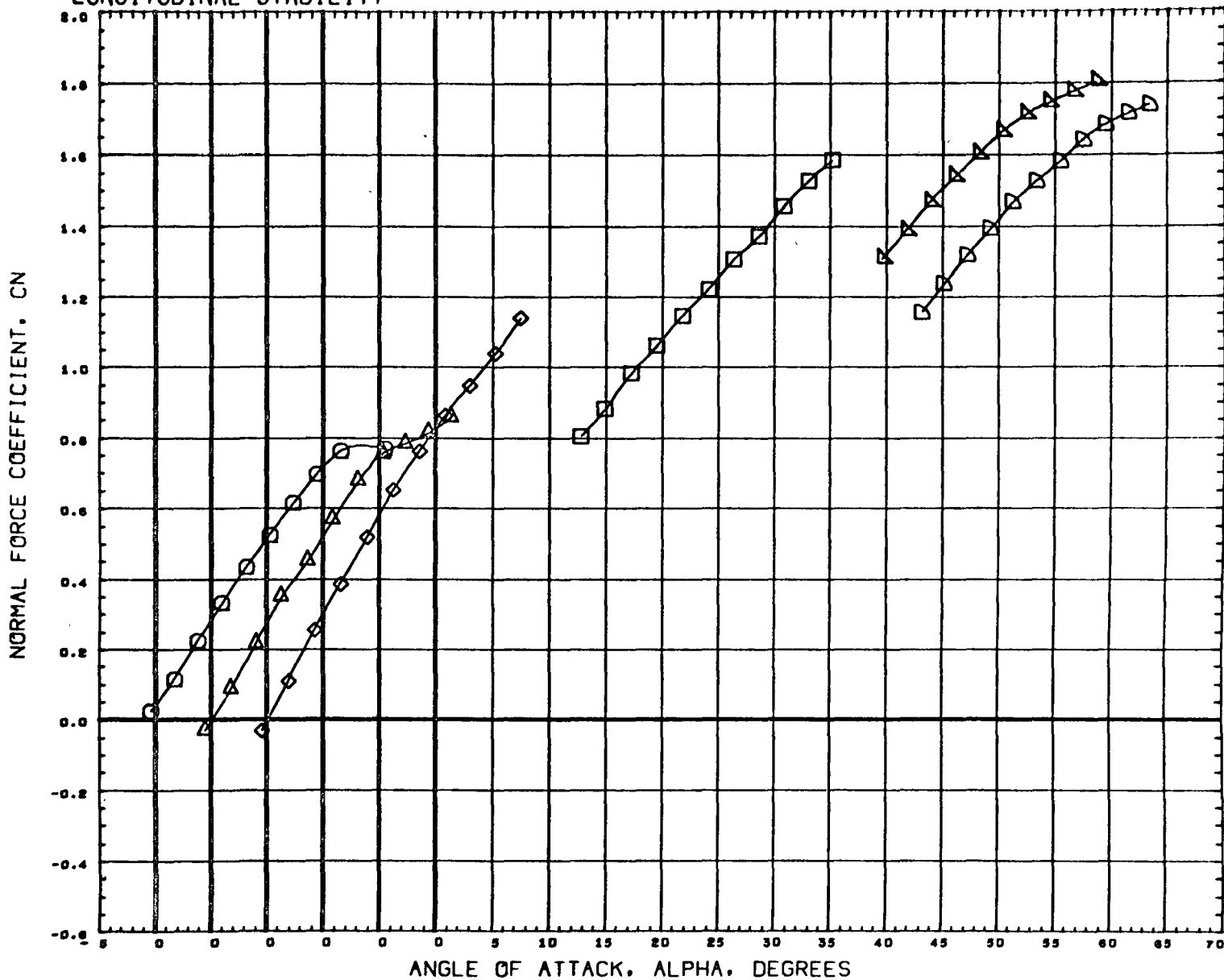
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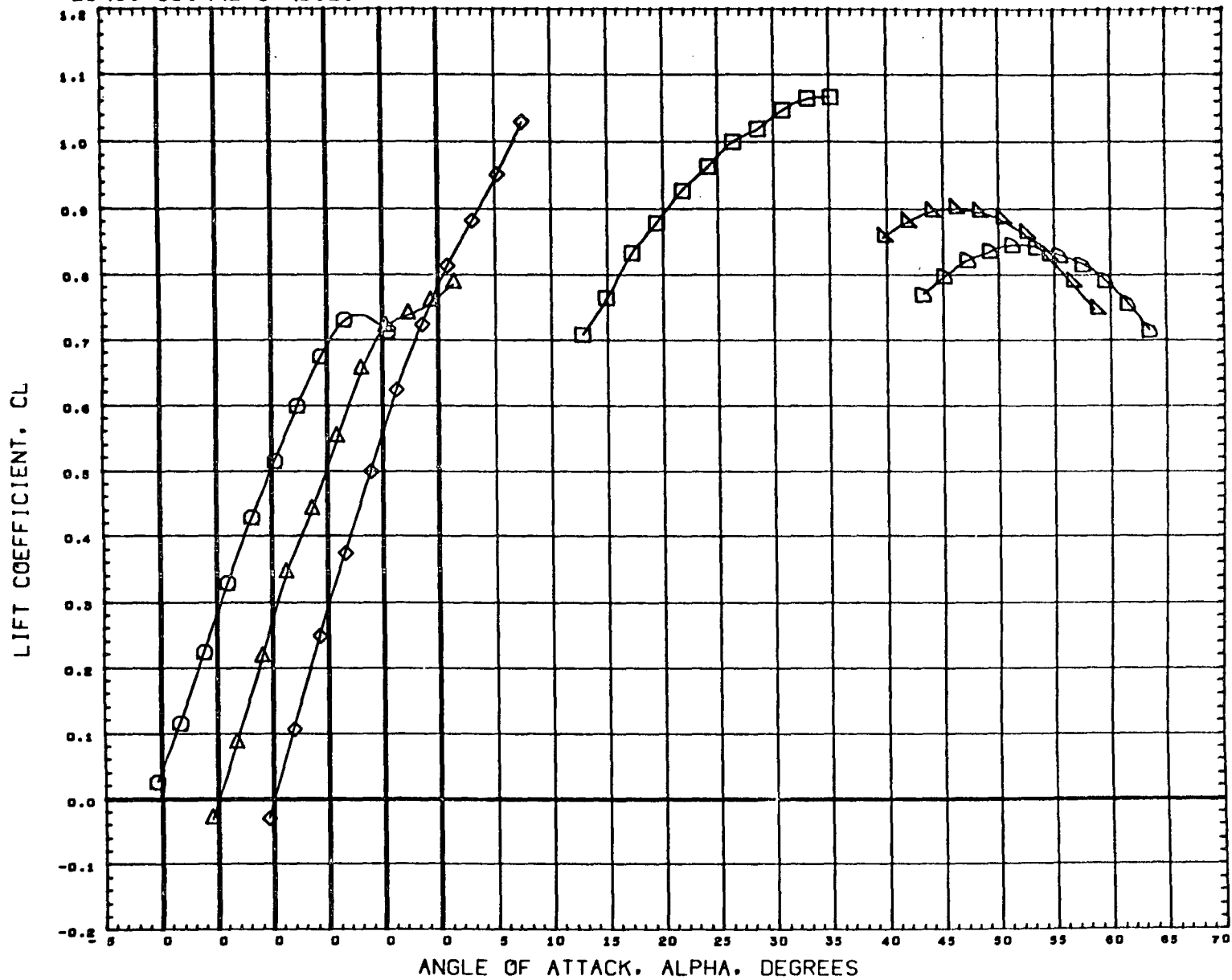
LONGITUDINAL STABILITY



SYMBOL		MACH	PARAMETRIC VALUES		
◯	0.399	BETA	0.000	RUDDER	0.000
△	0.904	RUDFLR	0.000		
◇	1.198				
◻	1.850				
◻	3.480				
◻	4.959	DATA HIST. CODE	*G6C*G		

REFERENCE INFORMATION		
SREF	14.6836	50. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

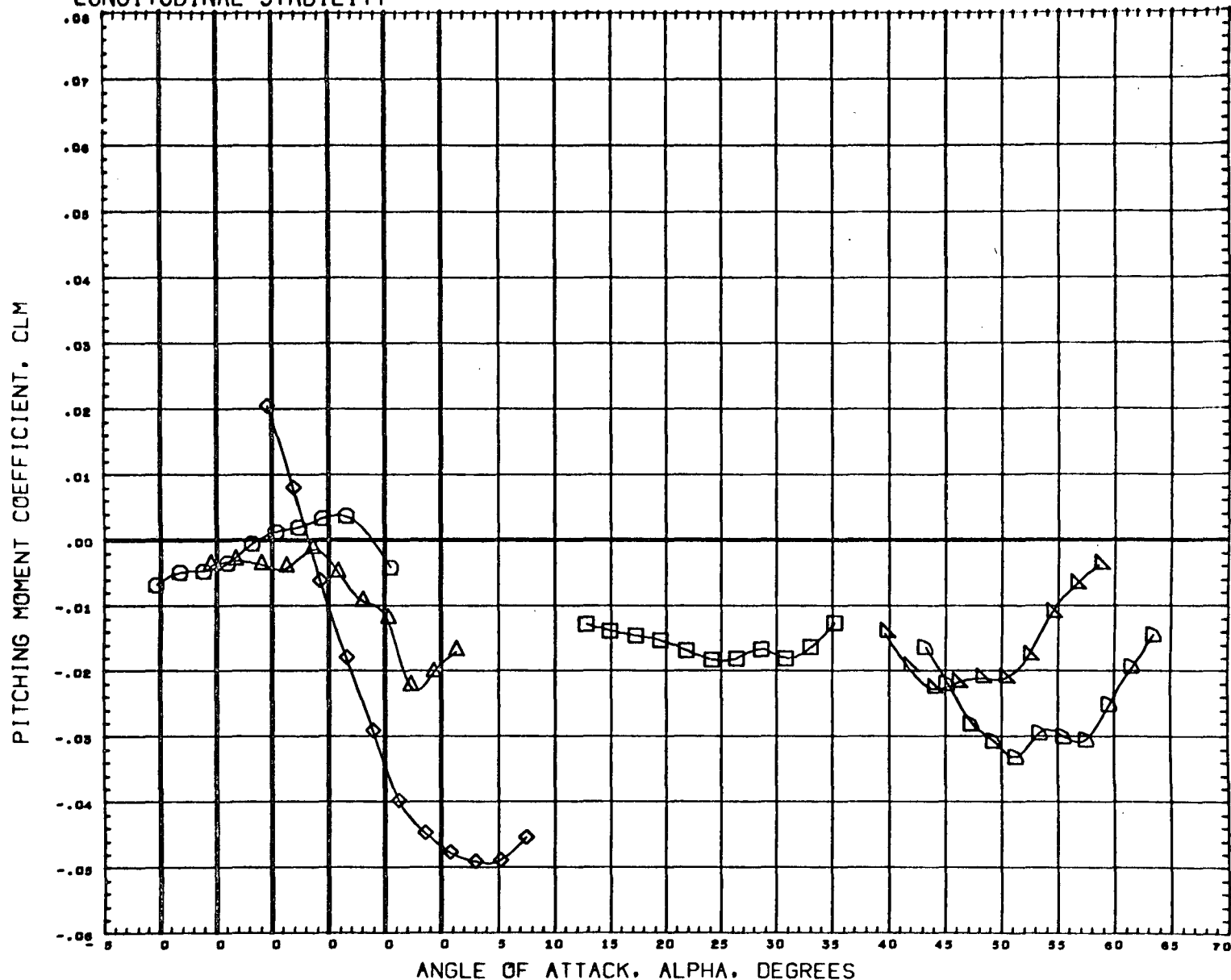
LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	0.999	BETA	0.000	RUDDER	0.000
△	0.904	RUDFLR	0.000		
◇	1.198				
□	1.950				
	3.480				
	4.959	DATA HIST. CODE	*GGC*G		

REFERENCE INFORMATION		
BREF	14.6636	30. IN.
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BREF	5.6530	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY

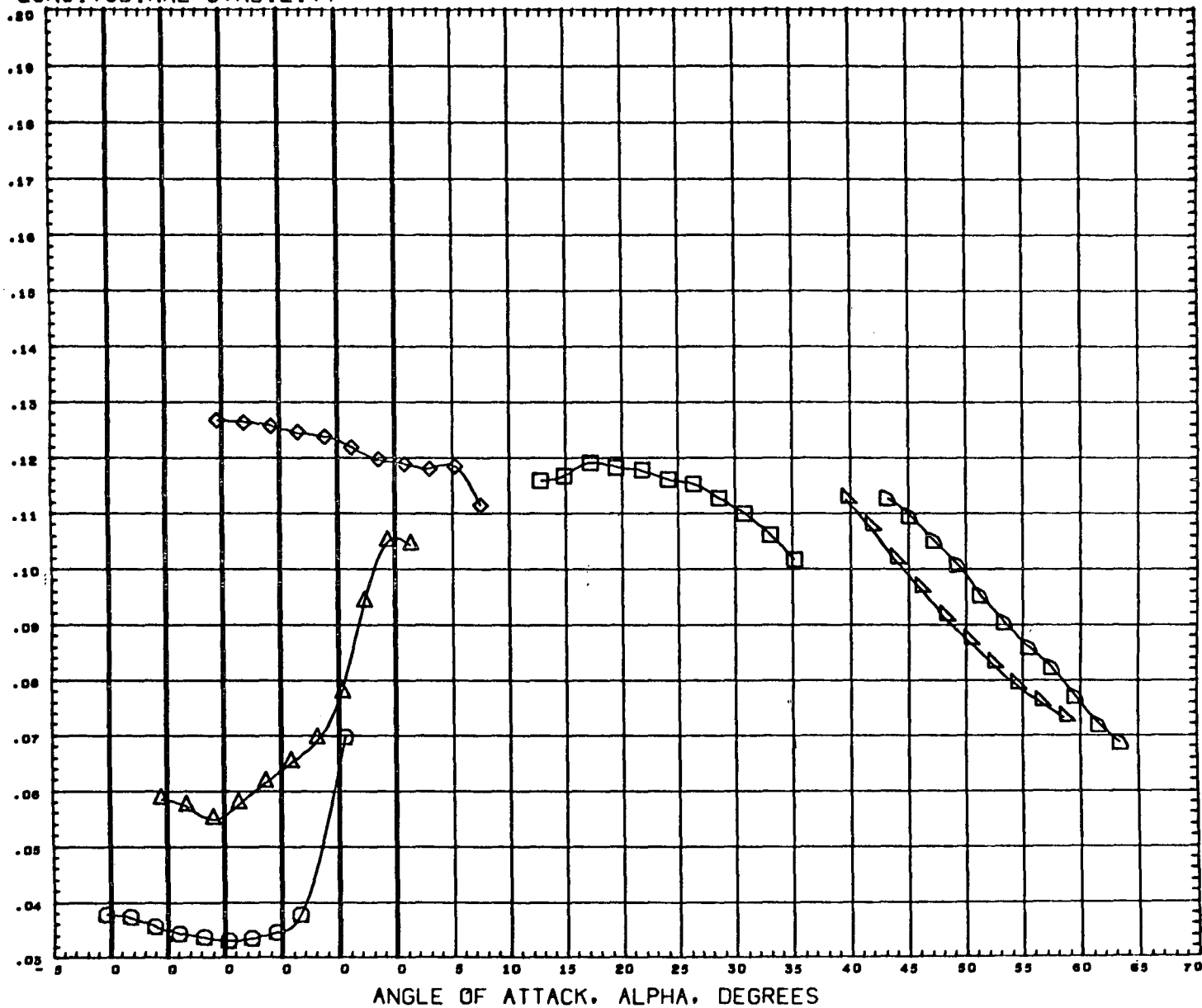


SYMBOL	MACH	PARAMETRIC VALUES		
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	0.904	RUDDLR	0.000	
	1.198			
	1.950			
	3.460			
	4.959	DATA HIST. CODE	*GGC*G	

REFERENCE INFORMATION		
SREF	14.6836	39. IN.
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BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

AXIAL FORCE CORRECTED TO FREE STREAM PRESSURE AT THE BASE REGION. CAT

LONGITUDINAL STABILITY

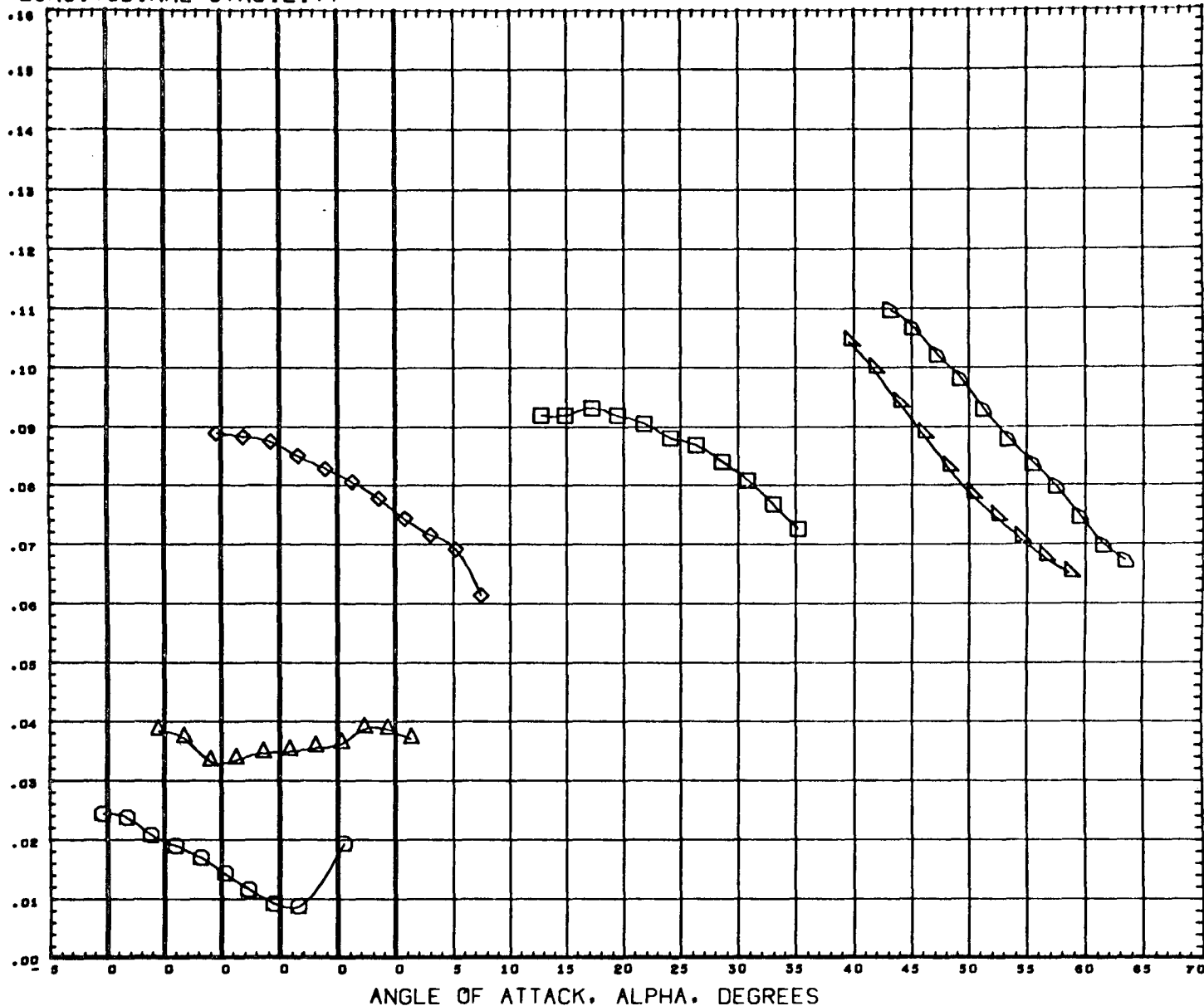


SYMBOL	MACH	PARAMETRIC VALUES		
◇	0.599	BETA	0.000	RUDDER
□	0.904	RUDFLR	0.000	0.000
△	1.198			
○	1.930			
×	3.480			
	4.939	DATA HIST. CODE	#G6C#G	

REFERENCE INFORMATION		
SREF	14.6836	50 IN.
LREF	4.5080	IN.
BREF	5.6530	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY

FOREBODY AXIAL FORCE COEFFICIENT, CAF

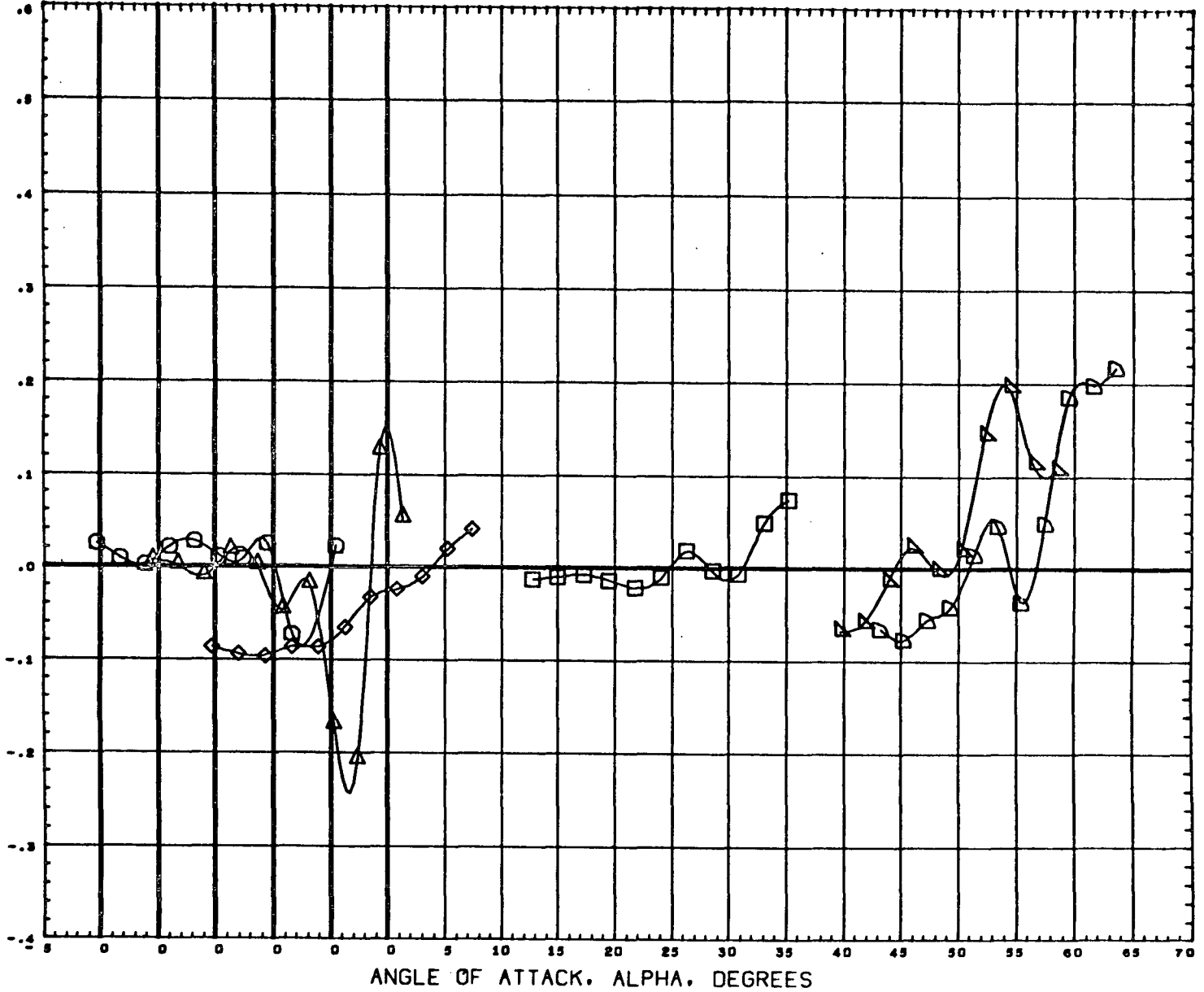


SYMBOL	MACH	PARAMETRIC VALUES		
△	0.599	BETA	0.000	RUDDER
□	0.904	RUDDLR	0.000	
◇	1.198			
○	1.930			
◻	3.480			
◼	4.939	DATA HIST. CODE	*GGC*G	

REFERENCE INFORMATION		
SREF	14.6836	30. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY

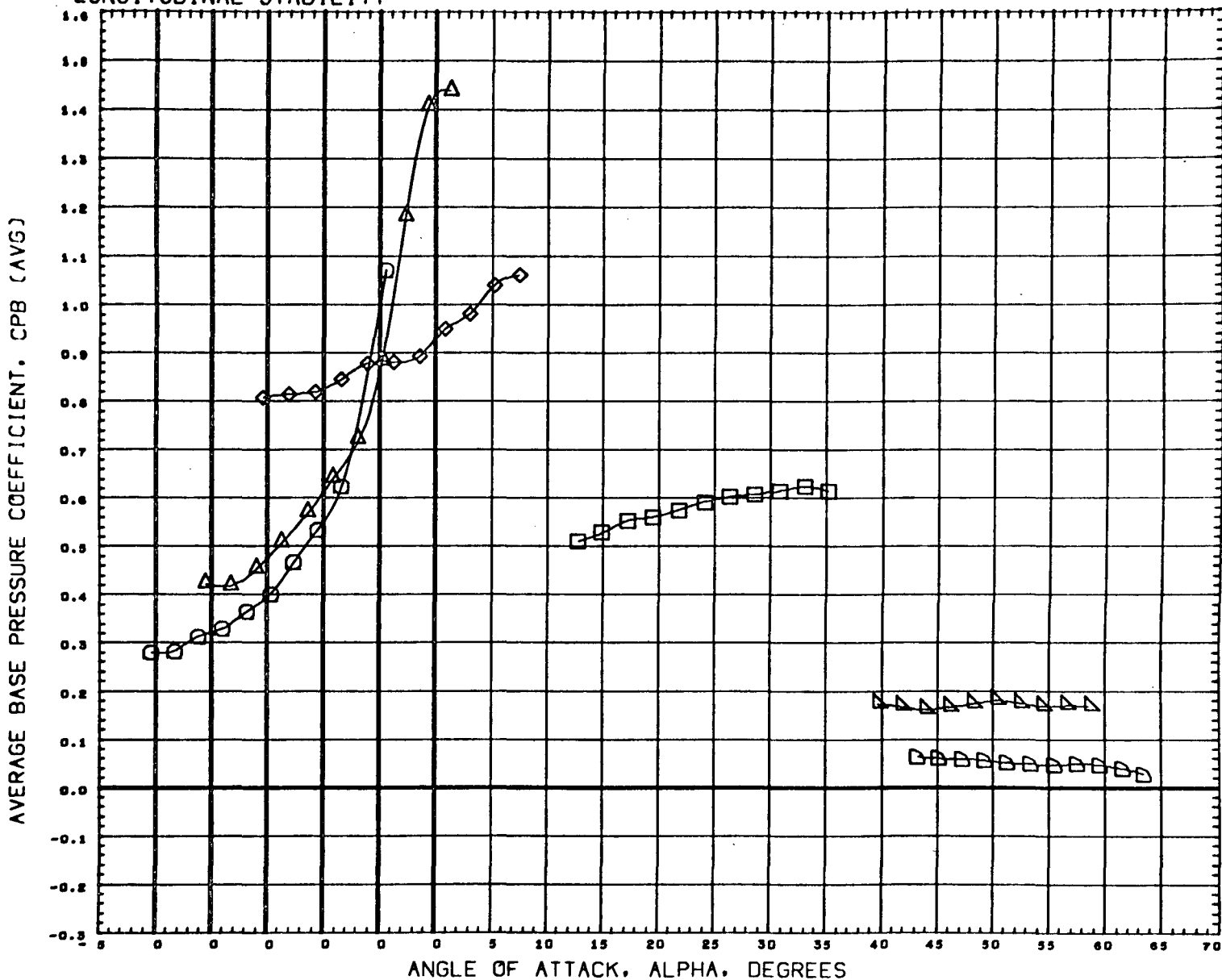
STATIC LONGITUDINAL STABILITY DERIVATIVE, D(CLM/CN)



SYMBOL MACH
 0.599 BETA 0.000 RUDDER 0.000
 0.904 RUDFLR 0.000
 1.198
 1.950
 3.480
 4.959 DATA HIST. CODE *66C*6

REFERENCE INFORMATION
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 BREF 5.6550 IN.
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 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

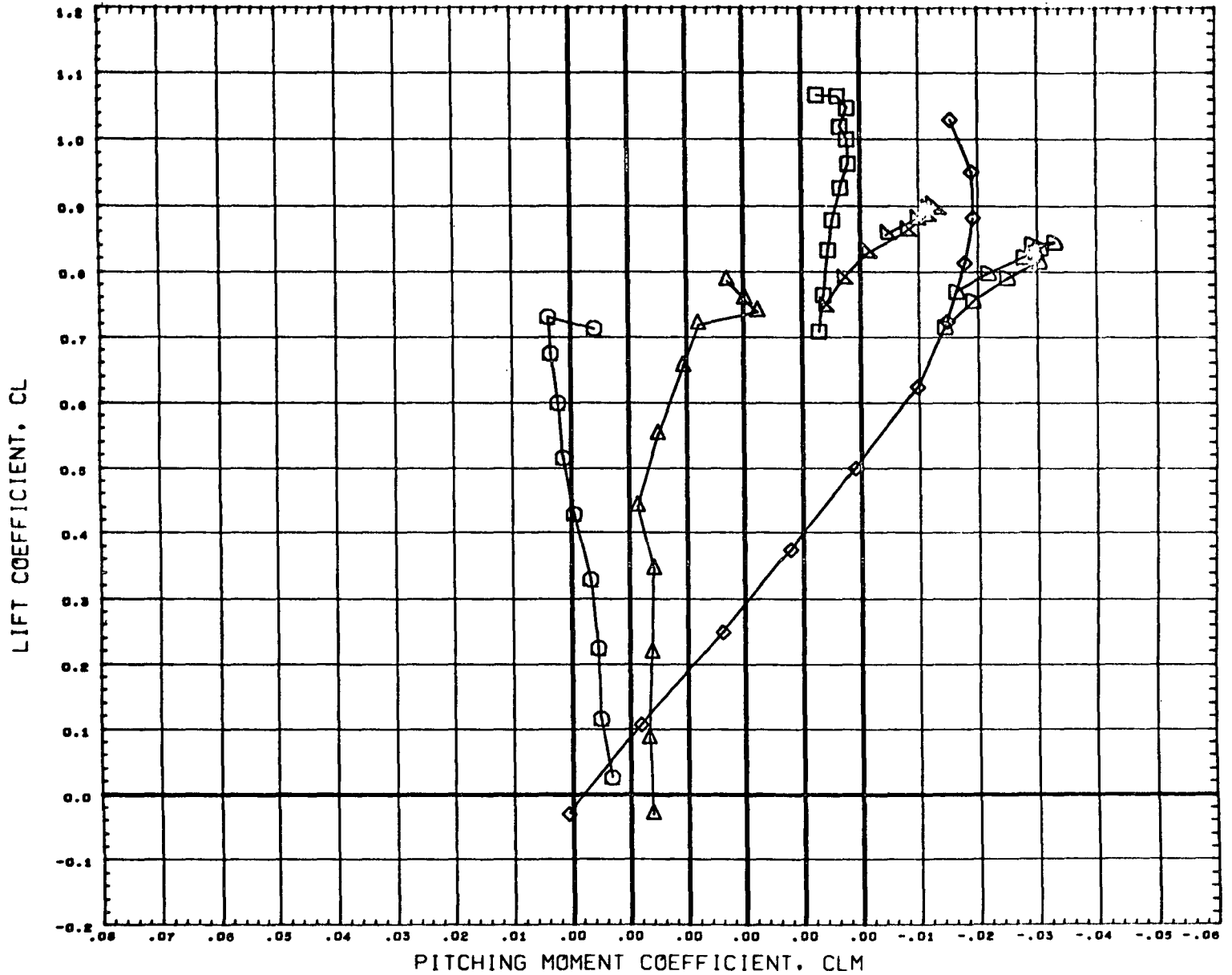
LONGITUDINAL STABILITY



SYMBOL MACH 0.999 0.904 1.108 1.950 3.480 4.999	PARAMETRIC VALUES			
	BETA	0.000	RUDDER	0.000
	RUDFLR	0.000		
	DATA HIST. CODE *GGC*G			

REFERENCE INFORMATION		
SREF	14.6836	30. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

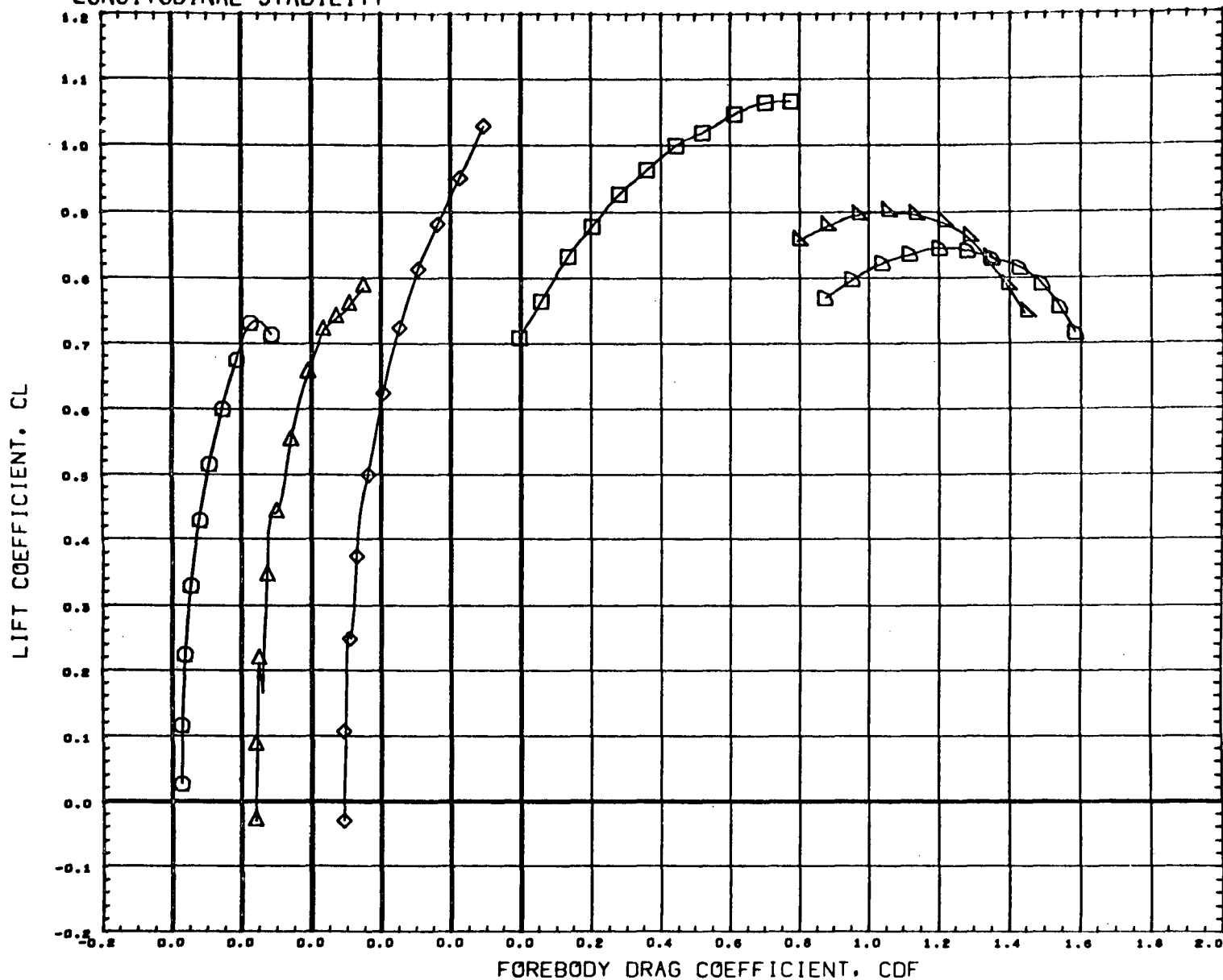
LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
○	0.599	BETA	0.000	RUDDER 0.000
△	0.904	RUDFLR	0.000	
□	1.198			
◇	1.930			
	3.480			
	4.939	DATA HIST. CODE	*GGC*G	

REFERENCE INFORMATION		
SREF	14.6836	SQ. IN.
LREF	4.9080	IN.
BREF	5.6550	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

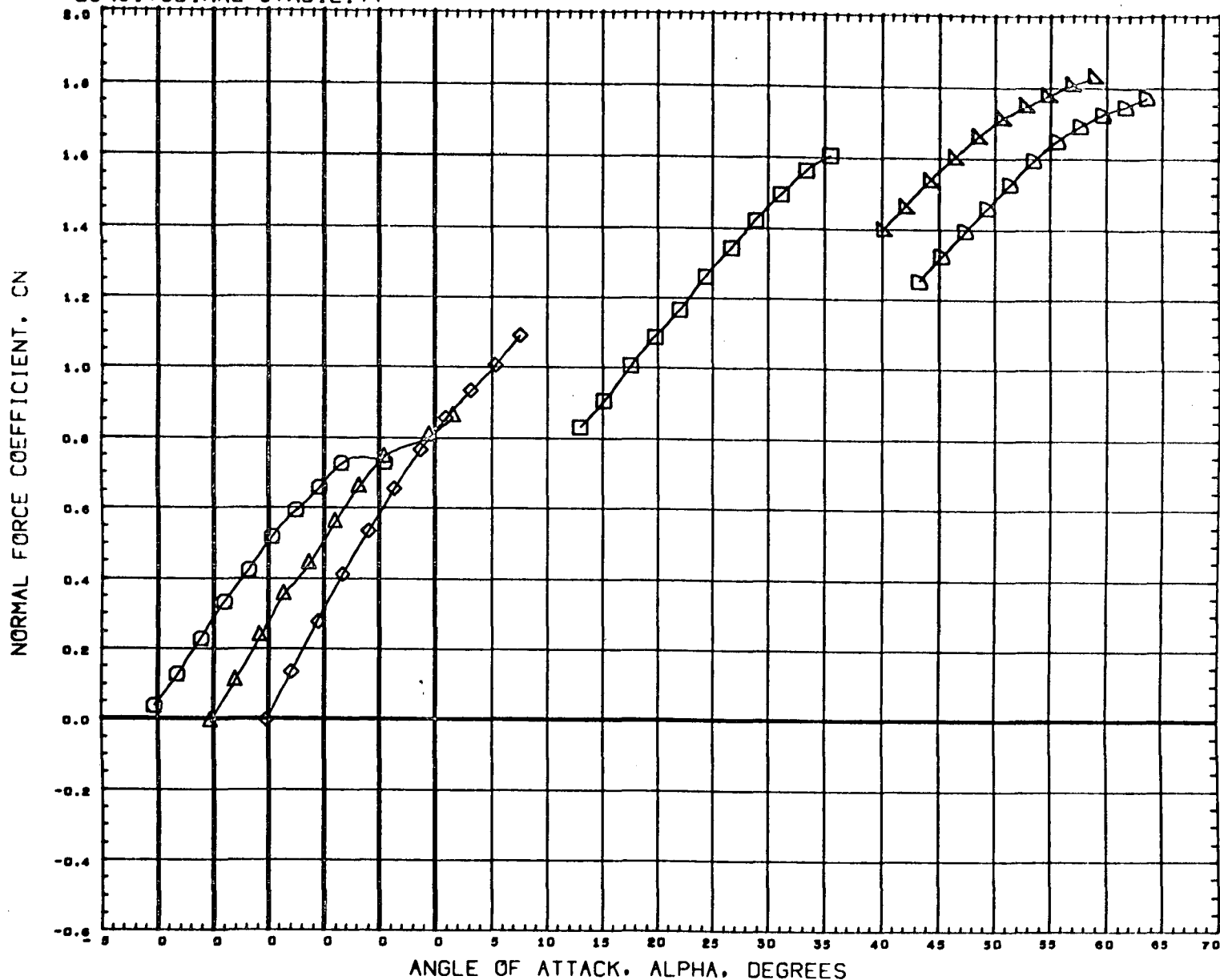
LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
○	0.599	BETA	0.000	RUDDER
△	0.904	RUDDL	0.000	
◇	1.198			
□	1.930			
▽	3.480			
◇	4.999	DATA HIST. CODE	*GGC*G	

REFERENCE INFORMATION		
SREF	14.6836	30. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY



SYMBOL ○ △ □ ◇ ▽	MACH	PARAMETRIC VALUES			
	0.600	BETA	0.000	RUDDER	0.000
	0.902	RUDFLR	30.000		
	1.196				
	1.951				
	3.480				
	4.959	DATA HIST. CODE	#GGC*G		

REFERENCE INFORMATION		
SREF	14.6836	59. IN.
LREF	4.5080	IN.
BREF	5.6350	IN.
XNRP	1.4821	IN.
YNRP	0.0000	IN.
ZNRP	0.0000	IN.
SCALE	0.0034	

MS13-MSFC MODELAR12161-2

B5CW11AF2S1V7E3

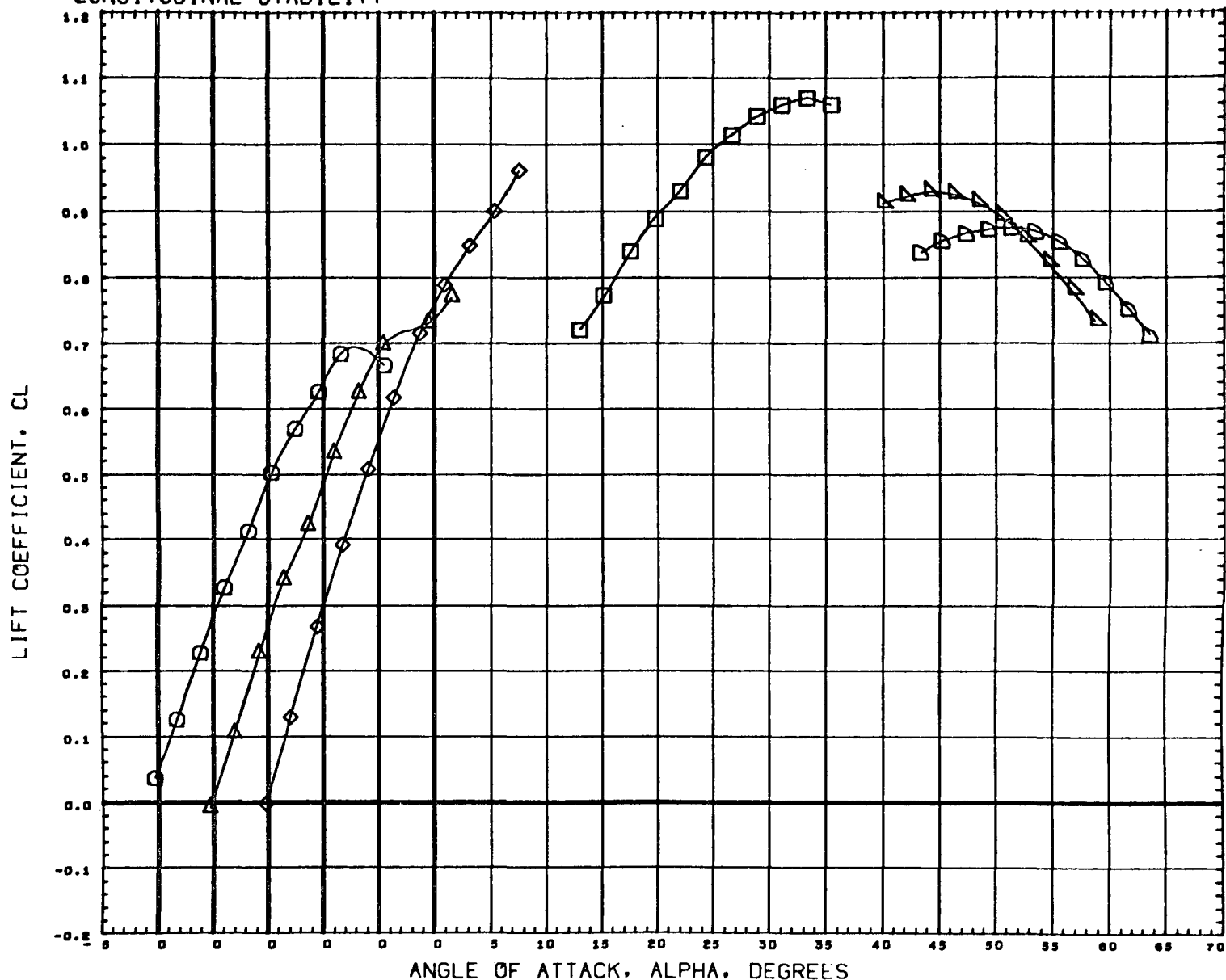
(S53091)

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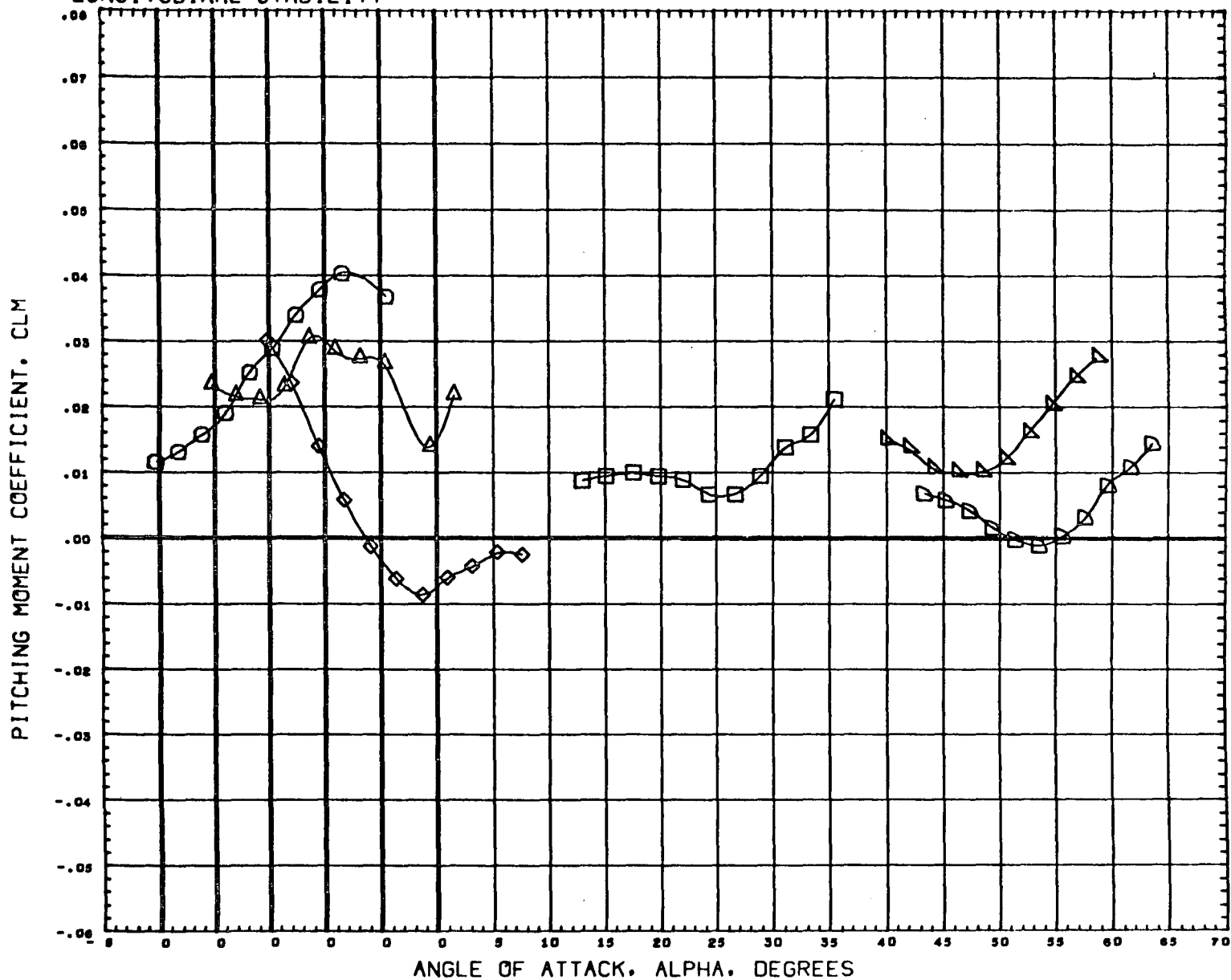
LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
○	0.600	BETA	0.000	RUDDER
△	0.902	RUDFLR	30.000	0.000
□	1.106			
◇	1.931			
▽	3.480			
◇	4.939	DATA HIST. CODE	*GGC*G	

REFERENCE INFORMATION		
SREF	14.6836	30. IN.
LREF	4.3080	IN.
BREF	5.6550	IN.
XNRP	1.4821	IN.
YNRP	0.0000	IN.
ZNRP	0.0000	IN.
SCALE	0.0034	

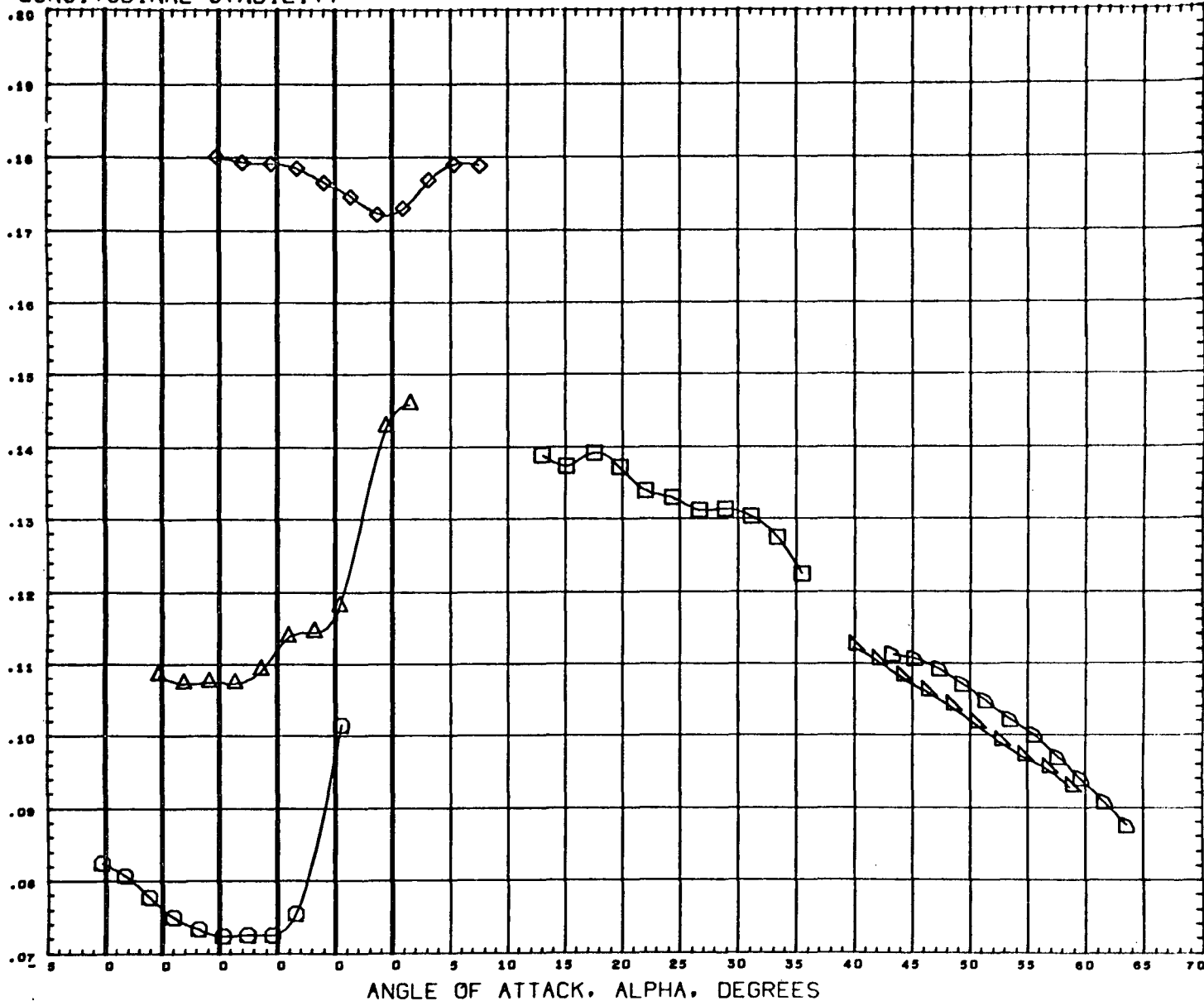
LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			REFERENCE INFORMATION		
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△	0.902	RUDDLR	30.000			LREF	4.5080 IN.
□	1.196					BREF	5.6550 IN.
◇	1.951					XMRP	1.4821 IN.
◇	3.480					YMRP	0.0000 IN.
◇	4.959	DATA HIST. CODE	*GGC*G			ZMRP	0.0000 IN.
						SCALE	0.0034

AXIAL FORCE CORRECTED TO FREE STREAM PRESSURE AT THE BASE REGION. CAT

LONGITUDINAL STABILITY

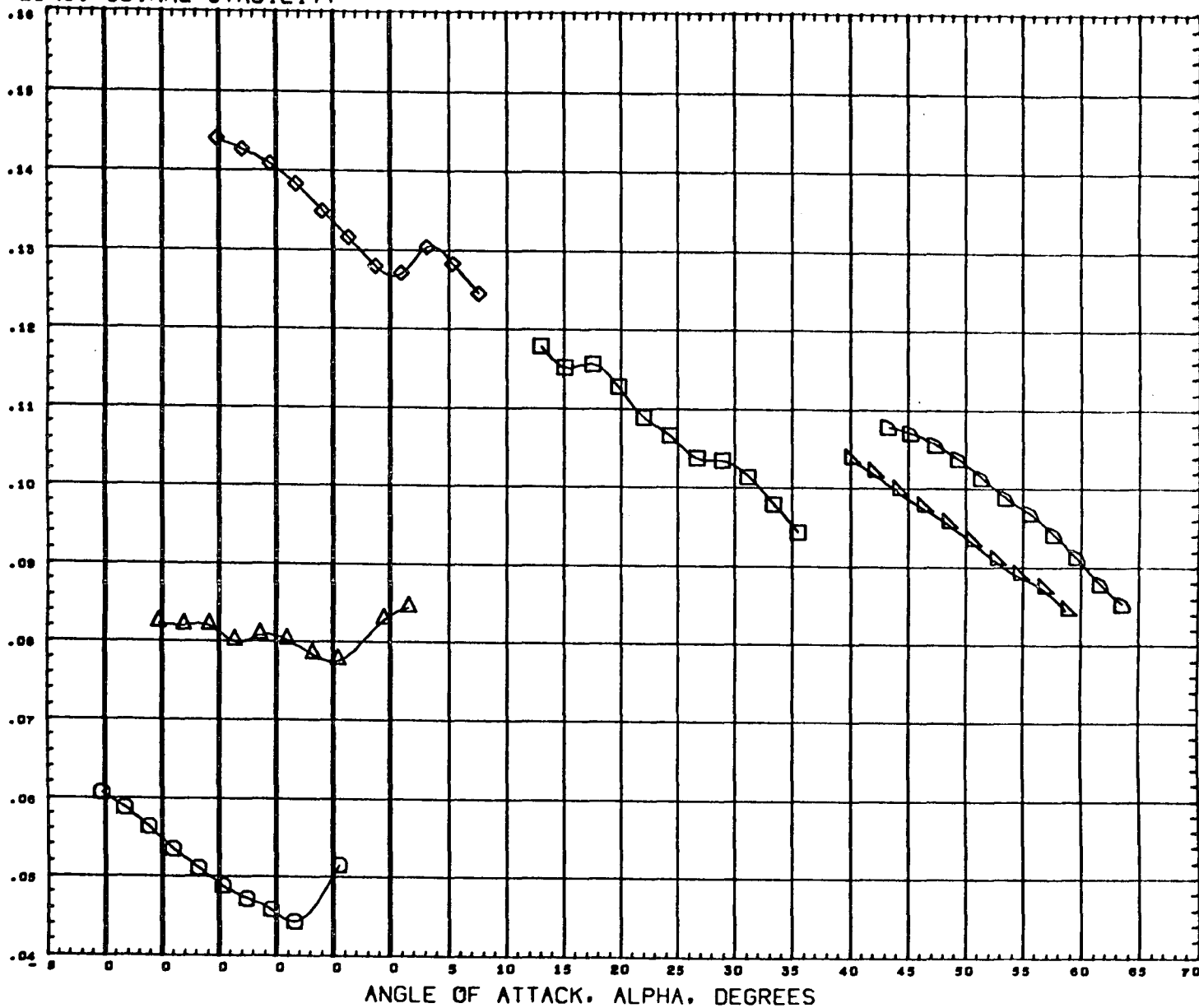


SYMBOL D □ ◇ △	MACH	PARAMETRIC VALUES			
	0.600	BETA	0.000	RUDDER	0.000
	0.902	RUDFLR	30.000		
	1.196				
	1.951				
	3.480				
	4.959	DATA HIST. CODE	*66C*6		

REFERENCE INFORMATION		
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BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY

FOREBODY AXIAL FORCE COEFFICIENT, CAF

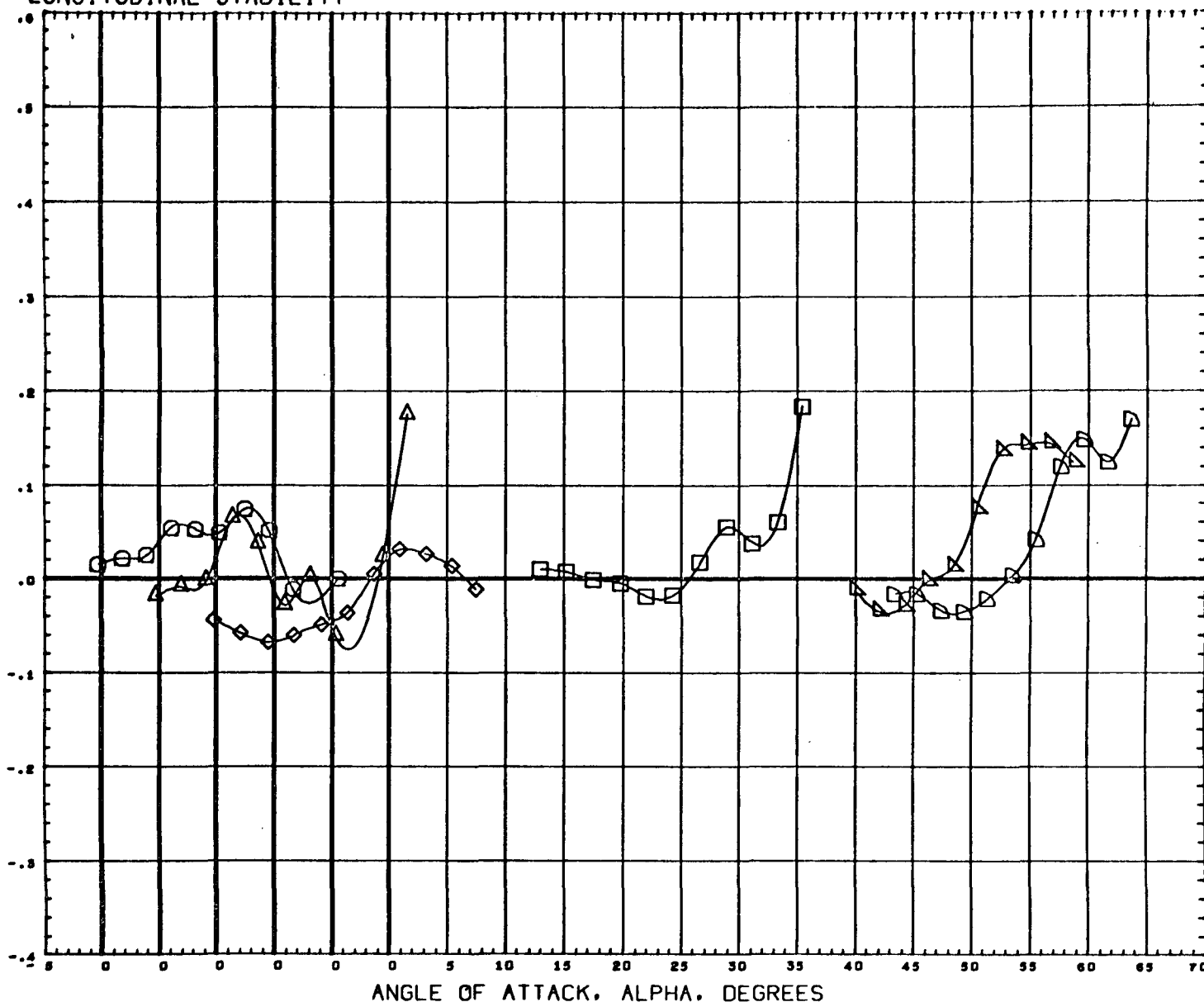


SYMBOL	MACH	PARAMETRIC VALUES			
	0.600	BETA	0.000	RUDDER	0.000
	0.902	RUDDFLR	30.000		
	1.196				
	1.951				
	3.480				
	4.959	DATA HIST. CODE	*GGC*G		

REFERENCE INFORMATION		
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LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY

STATIC LONGITUDINAL STABILITY DERIVATIVE, $D(C_{LM}/C_N)$



ANGLE OF ATTACK, ALPHA, DEGREES

SYMBOL	MACH	PARAMETRIC VALUES			
	0.600	BETA	0.000	RUDDER	0.000
	0.902	RUDDER	30.000		
	1.196				
	1.931				
	3.480				
4.939	DATA HIST. CODE	#GGC*G			

REFERENCE INFORMATION		
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BREF	5.6550	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E3

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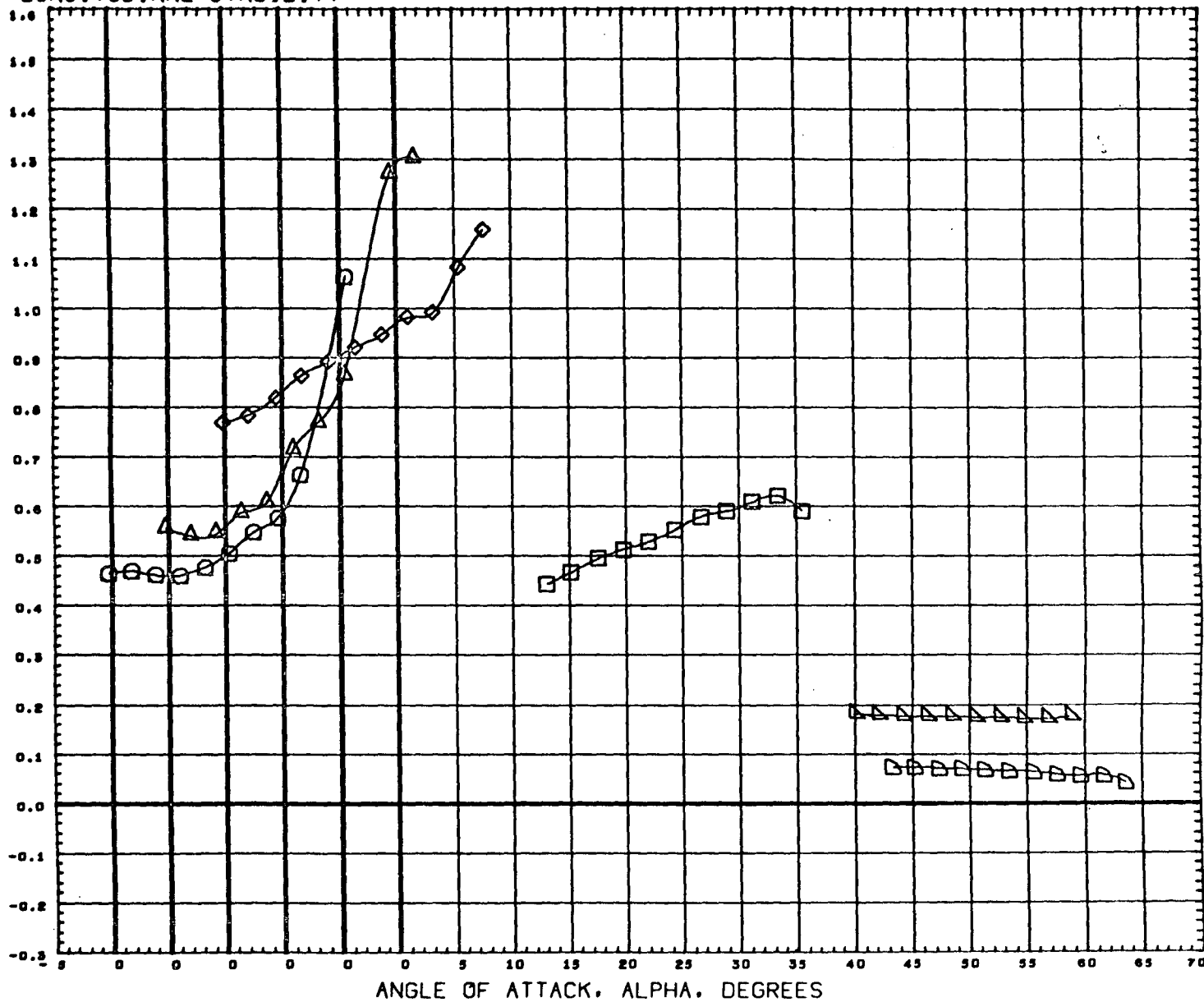
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LONGITUDINAL STABILITY

AVERAGE-BASE PRESSURE COEFFICIENT, CPB (AVG)



SYMBOL	MACH	PARAMETRIC VALUES			
	0.600	BETA	0.000	RUDDER	0.000
	0.902	RUDFLR	30.000		
	1.196				
	1.951				
	3.480				
	4.959	DATA HIST. CODE	*GGC*G		

REFERENCE INFORMATION		
SREF	14.6836	30. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRF	1.4821	IN.
YMRF	0.0000	IN.
ZMRF	0.0000	IN.
SCALE	0.0034	

M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E3

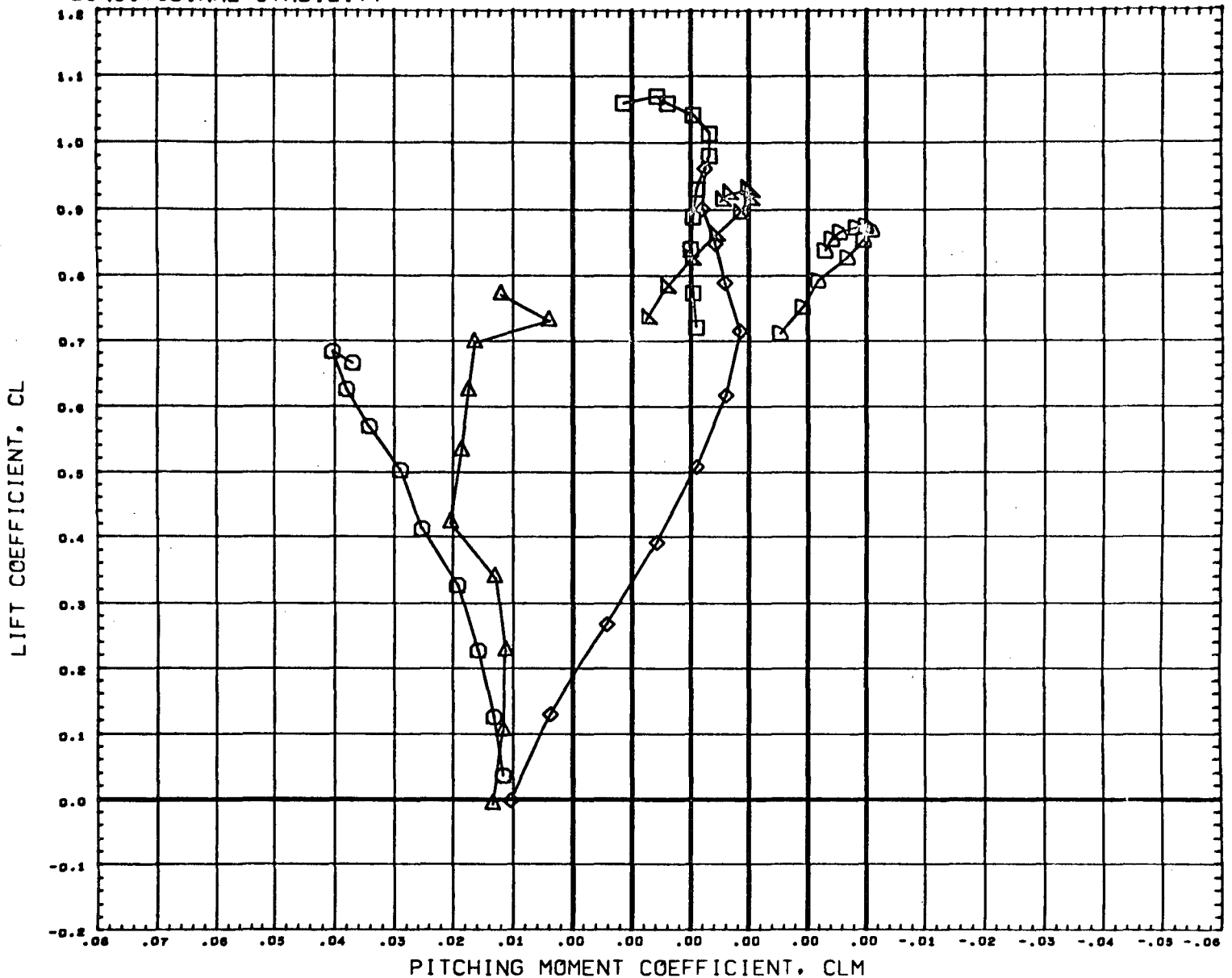
(S53091)

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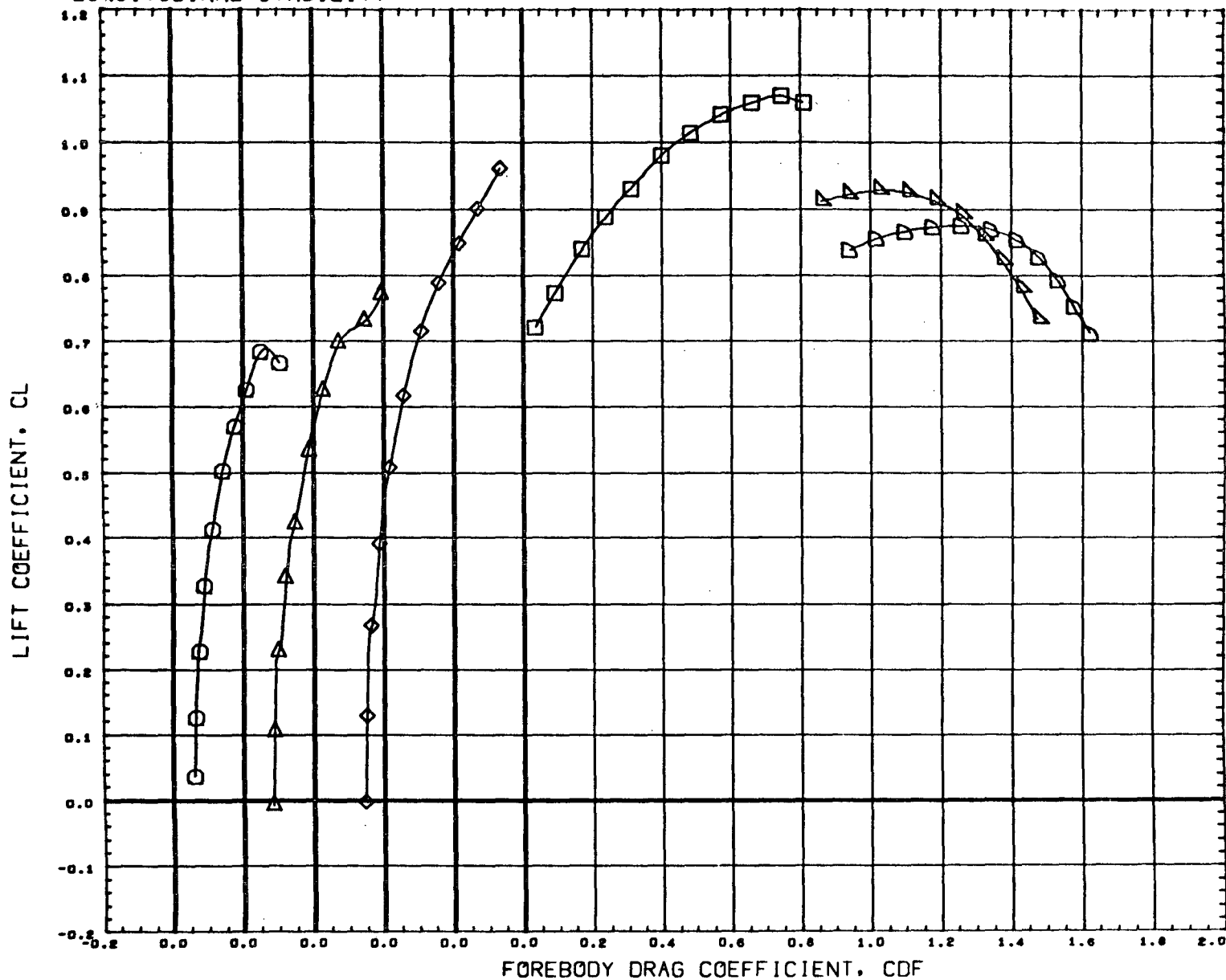
LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
○	0.600	BETA	0.000	RUDDER
◇	0.902	RUDDLR	30.000	
□	1.196			
△	1.951			
▽	3.480			
◇	4.959	DATA HIST. CODE	*GGC*G	

REFERENCE INFORMATION		
SREF	14.6836	50. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES
○	0.600	BETA 0.000 RUDDER 0.000
△	0.902	RUDFLR 30.000
◇	1.196	
□	1.951	
○	3.480	
○	4.959	DATA HIST. CODE *GGC*G

REFERENCE INFORMATION		
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LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0010	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E3

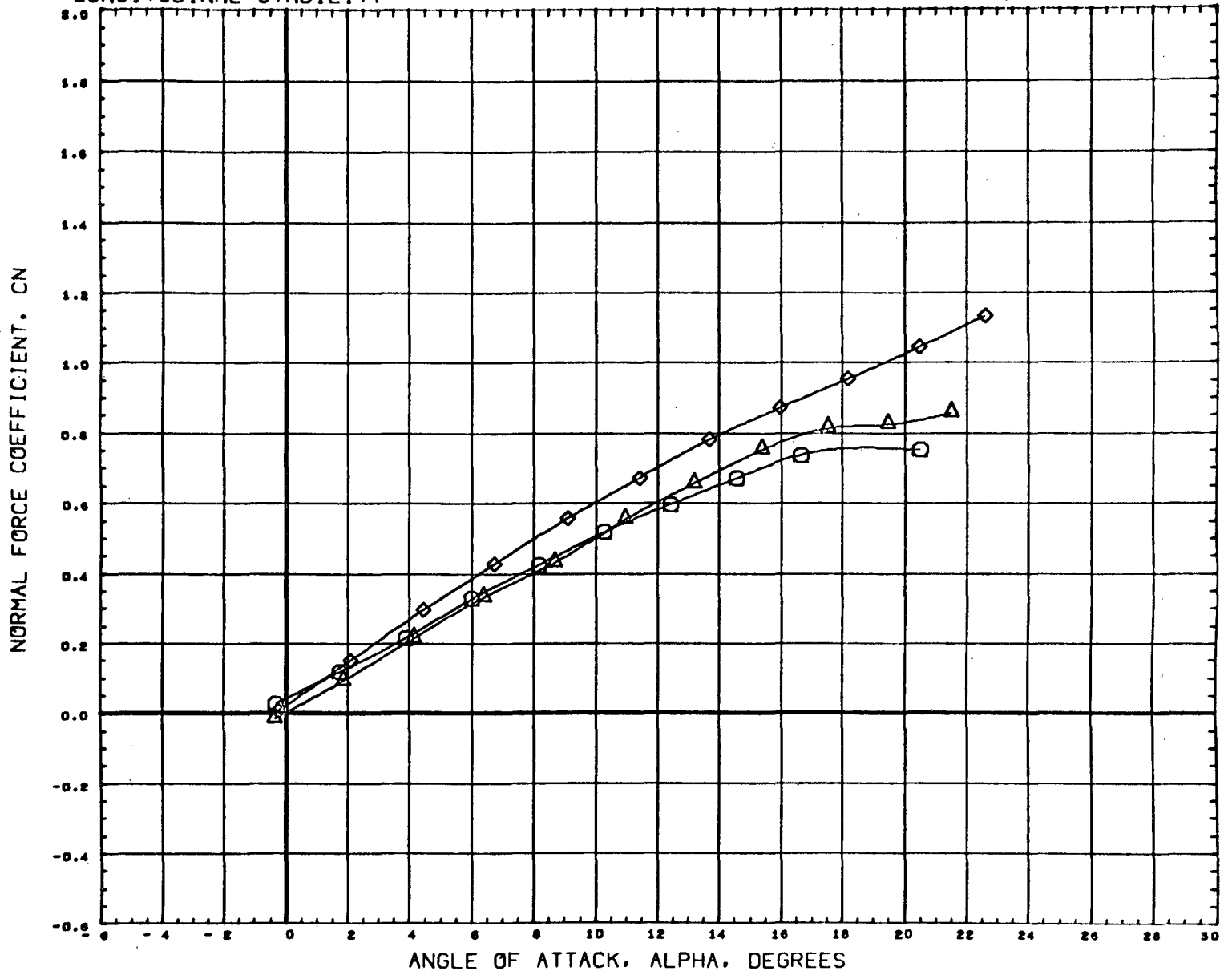
(S53091)

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LONGITUDINAL STABILITY

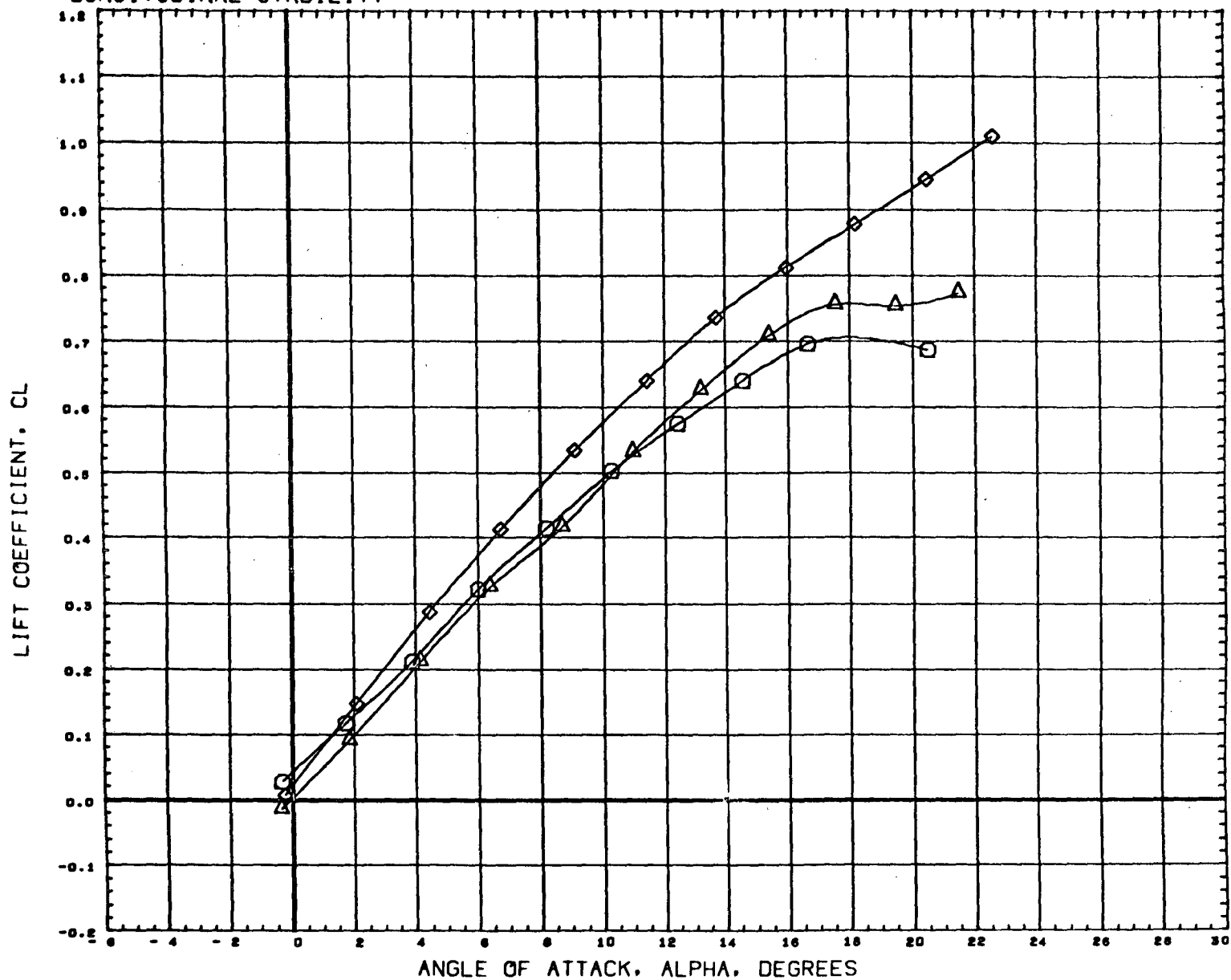


SYMBOL	MACH	PARAMETRIC VALUES		
○	0.998	BETA	0.000	RUDDER
△	0.906	RUDDLR	30.000	0.000
◇	1.201			

REFERENCE INFORMATION		
SREF	14.6836	SQ. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC*G

LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	0.598	BETA	0.000	RUDDER	0.000
△	0.906	RUDFLR	30.000		
◇	1.201				

REFERENCE INFORMATION		
SREF	14.6836	89. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC#6

M513-MSFC MODELAR12161-2

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(S5310A)

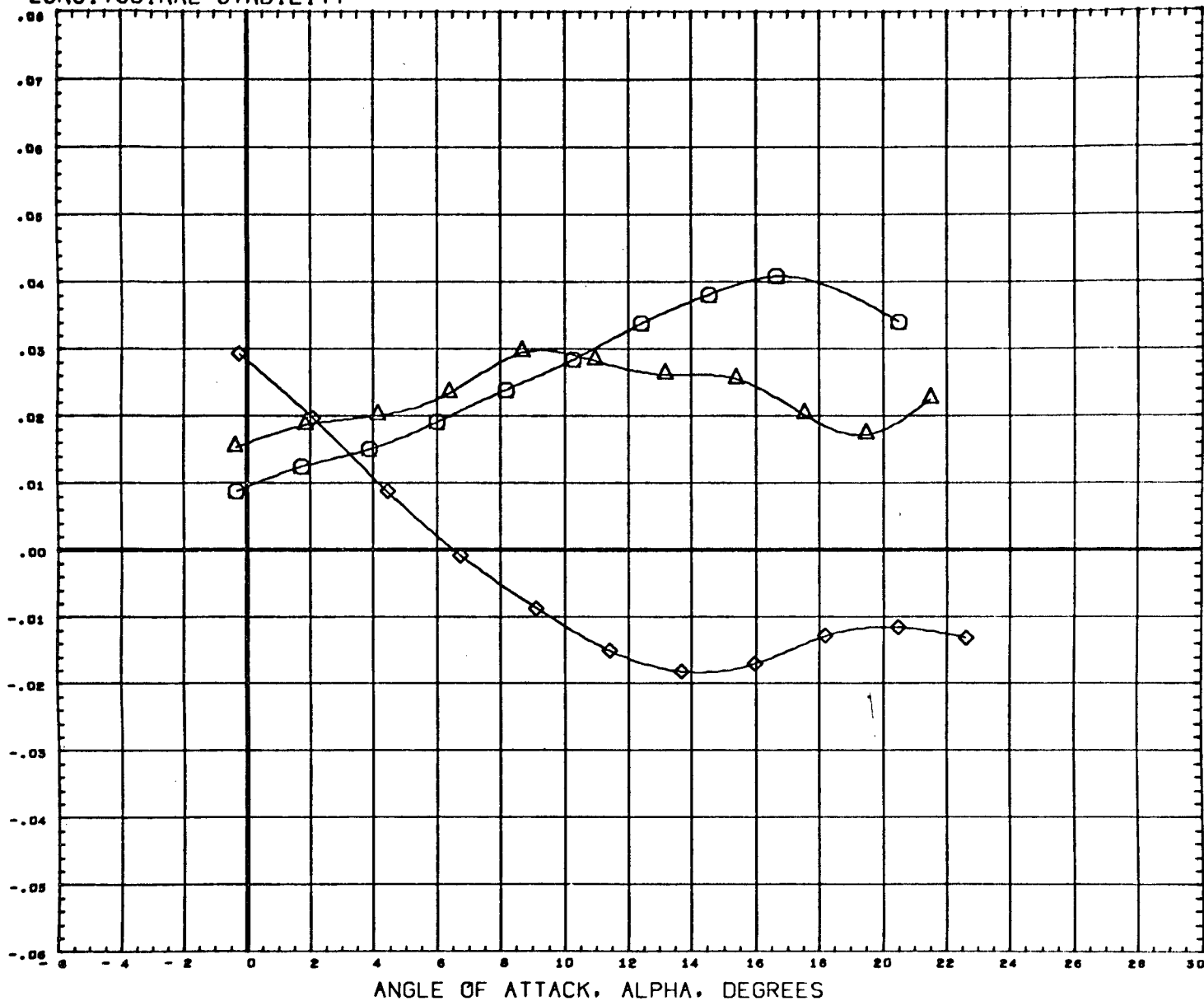
18 MAR 72

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LONGITUDINAL STABILITY

PITCHING MOMENT COEFFICIENT, CLM



ANGLE OF ATTACK, ALPHA, DEGREES

SYMBOL	MACH	PARAMETRIC VALUES		
○	0.598	BETA	0.000	RUDDER 0.000
△	0.906	RUDFLR	30.000	
◇	1.201			

REFERENCE INFORMATION		
SREF	14.6836	50. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC*G

M513-MSFC MODELAR12161-2

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(S5310A)

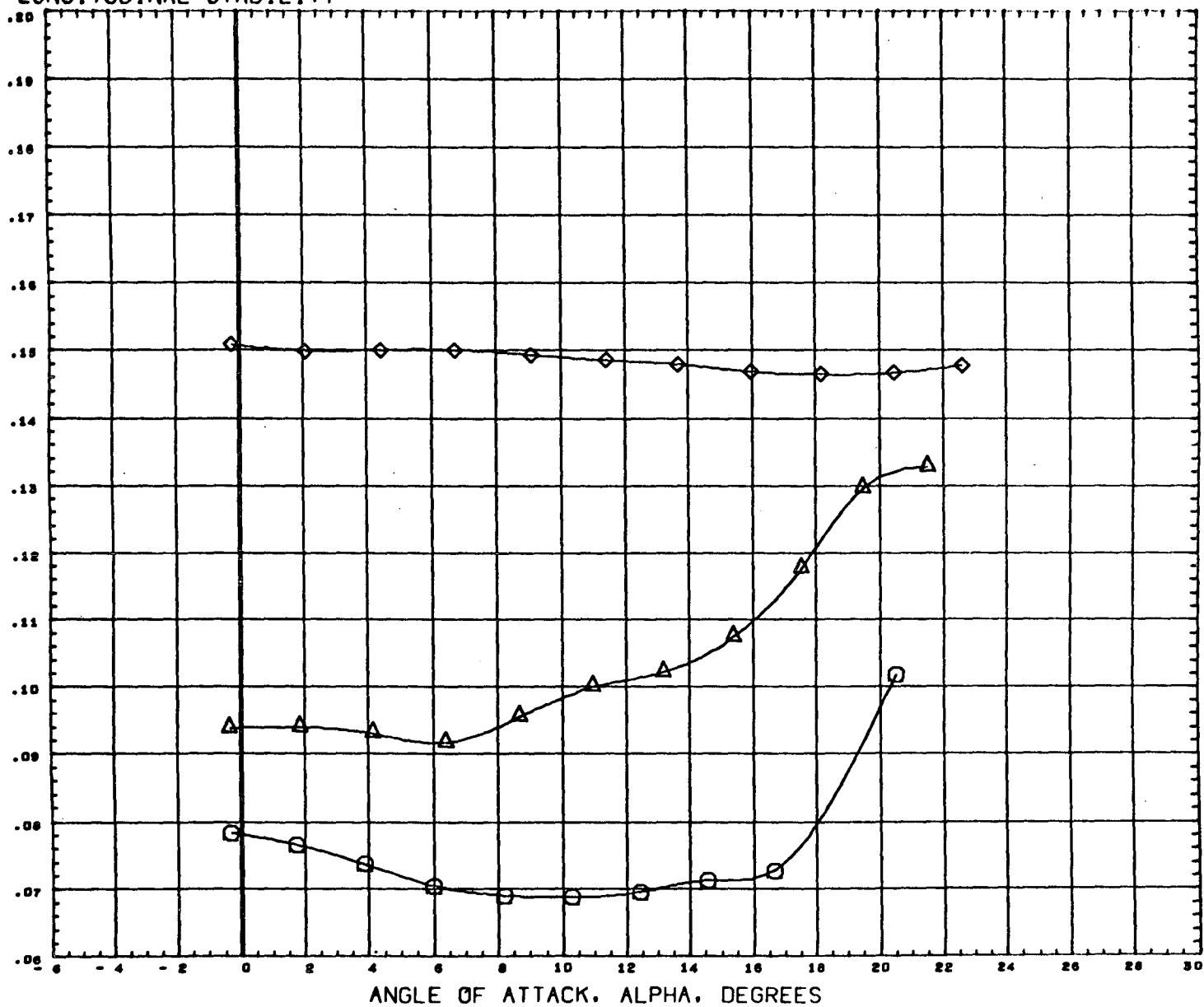
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AXIAL FORCE CORRECTED TO FREE STREAM PRESSURE AT THE BASE REGION. CAT

LONGITUDINAL STABILITY



SYMBOL ◇◇	MACH	PARAMETRIC VALUES			
	0.598	BETA	0.000	RUDDER	0.000
	0.906	RUDDL	30.000		
	1.201				

REFERENCE INFORMATION		
SREF	14.6836	50. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC*G

M513-MSFC MODELAR12161-2

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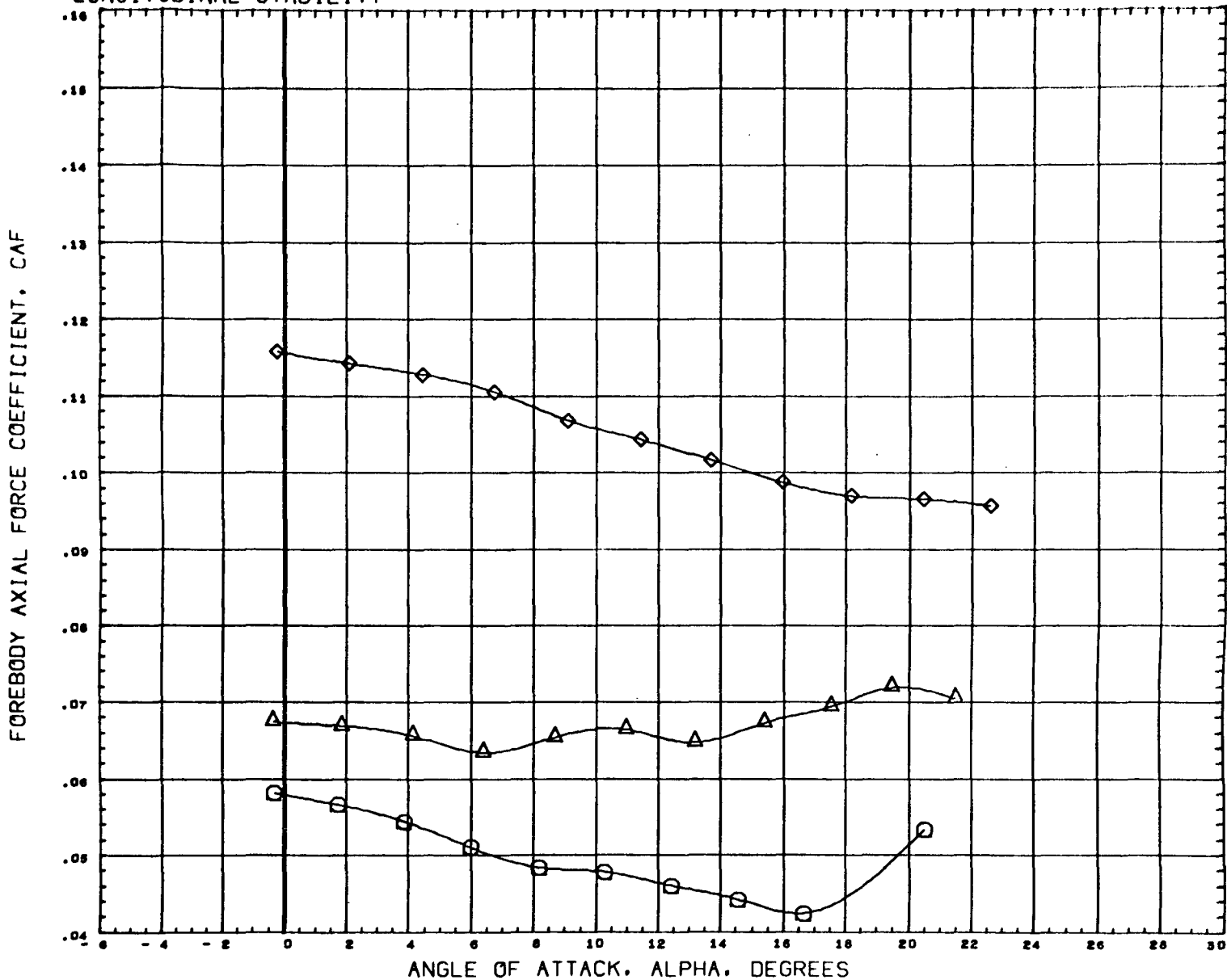
(S5310A)

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LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	0.598	BETA	0.000	RUDDER	0.000
△	0.906	RUDFLR	30.000		
◇	1.201				

REFERENCE INFORMATION		
SREF	14.6836	89. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC*G

M513-MSFC MODELAR1216I-2

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(S5310A)

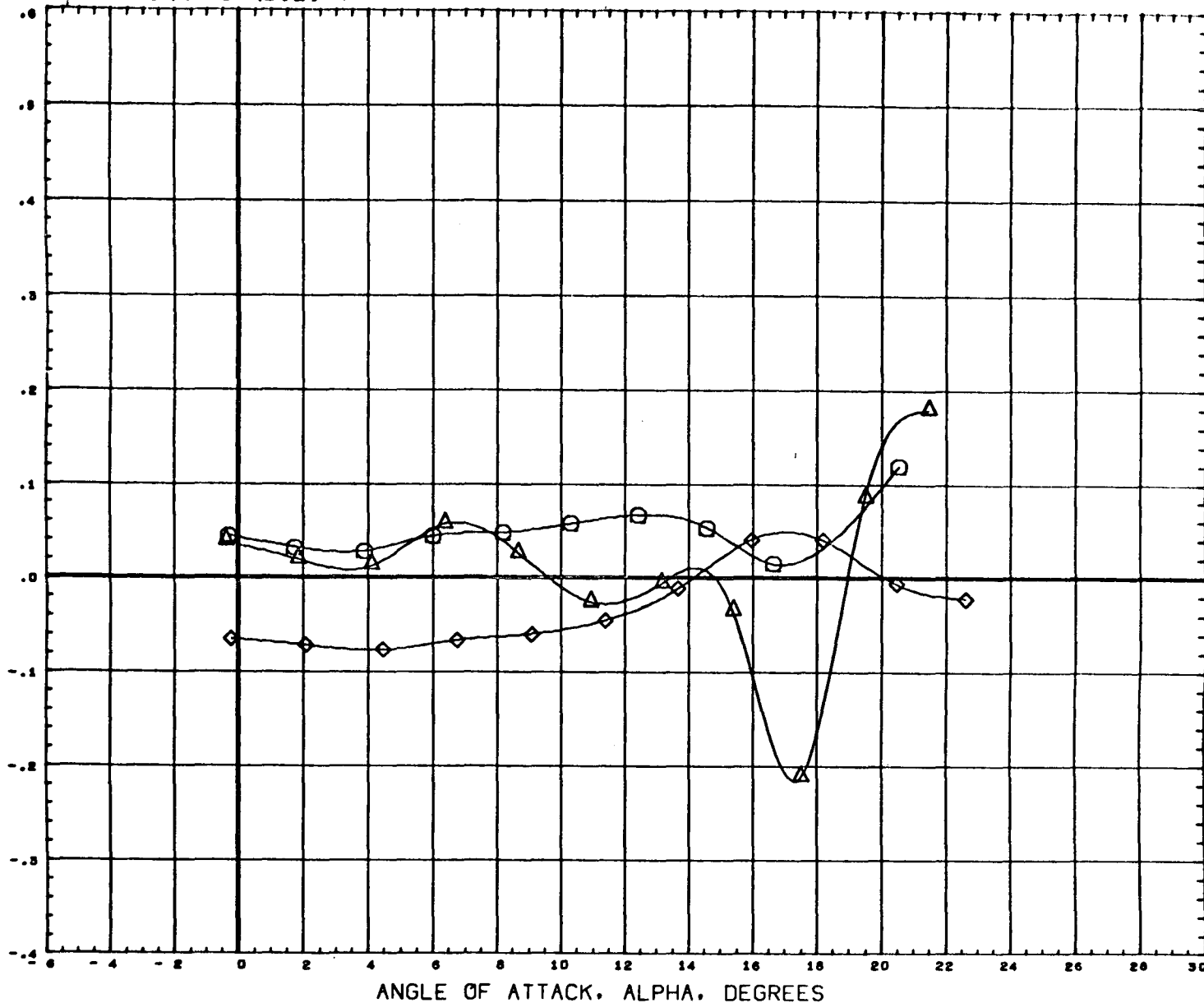
18 MAR 72

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LONGITUDINAL STABILITY

STATIC LONGITUDINAL STABILITY DERIVATIVE, $D(C_{LM}/CN)$



SYMBOL	MACH	PARAMETRIC VALUES			
○	0.596	BETA	0.000	RUDDER	0.000
△	0.906	RUDFLR	30.000		
◇	1.201				

REFERENCE INFORMATION		
SREF	14.6836	SQ. IN.
LREF	4.3080	IN.
BREF	5.6550	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC*G

M513-MSFC MODELAR12161-2

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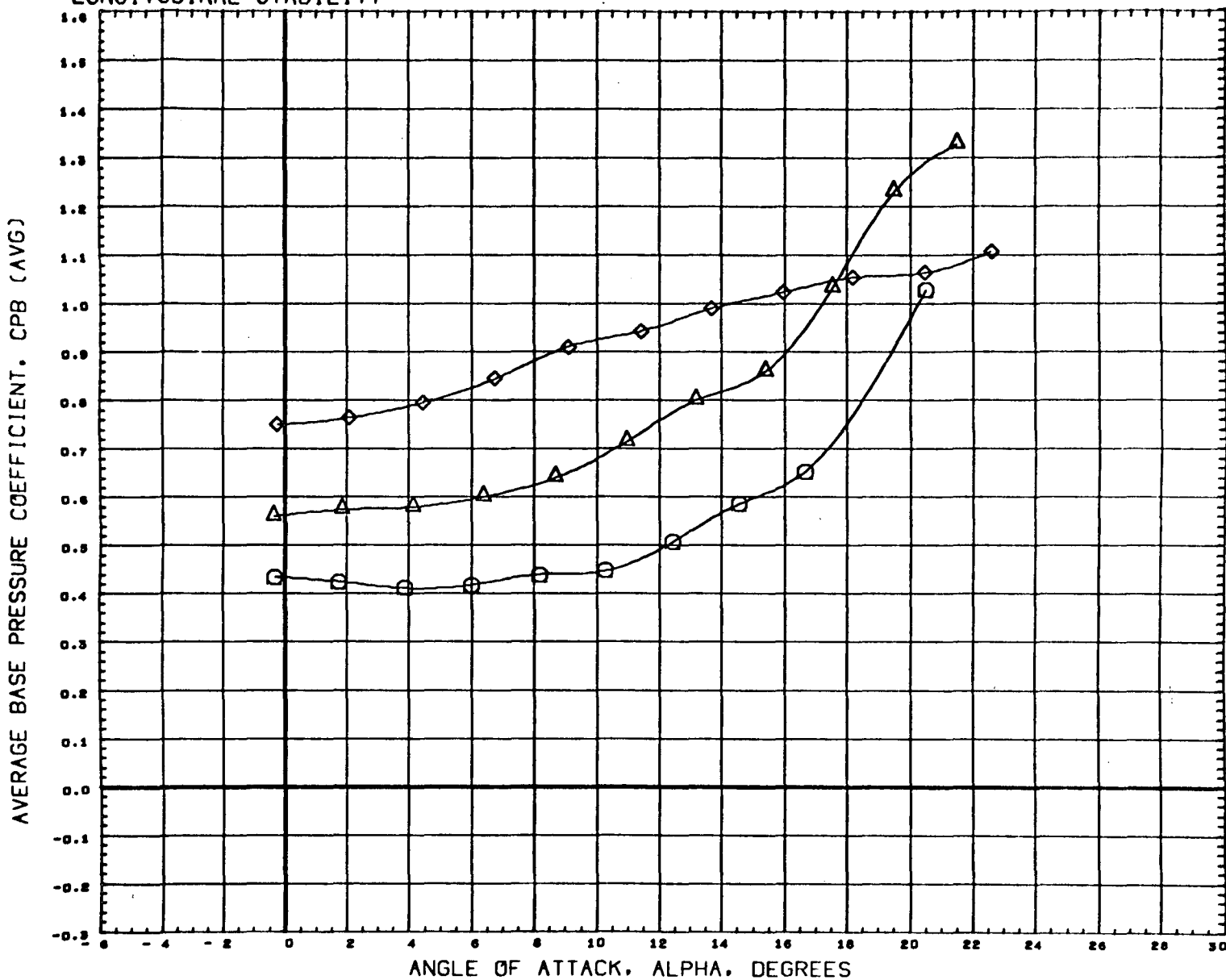
(S5310A)

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LONGITUDINAL STABILITY



SYMBOL ○ △ ◇	MACH	PARAMETRIC VALUES			
	0.998	BETA	0.000	RUDDER	0.000
	0.906	RUDDLR	30.000		
	1.201				

REFERENCE INFORMATION		
SREF	14.6836	sq. in.
LREF	4.5080	in.
BREF	5.6550	in.
XMRP	1.4821	in.
YMRP	0.0000	in.
ZMRP	0.0000	in.
SCALE	0.0034	

DATA HIST. CODE GC*G

M513-MSFC MODELAR12161-2

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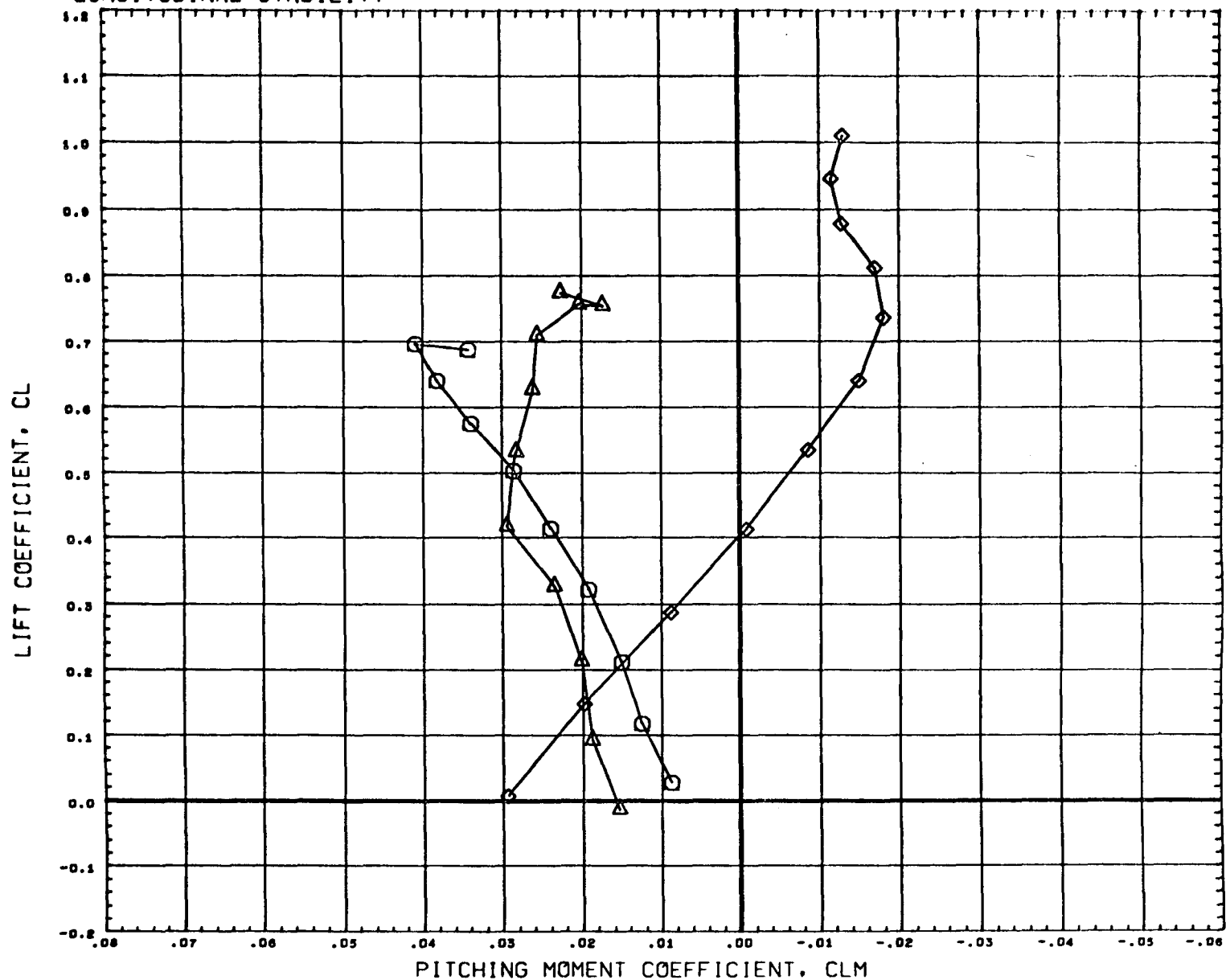
(S5310A)

18 MAR 72

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79

LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
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△	0.906	RUDDLR	30.000	
◇	1.201			

REFERENCE INFORMATION		
SREF	14.6836	80. IN.
LREF	4.5080	IN.
BREF	5.6350	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC*G

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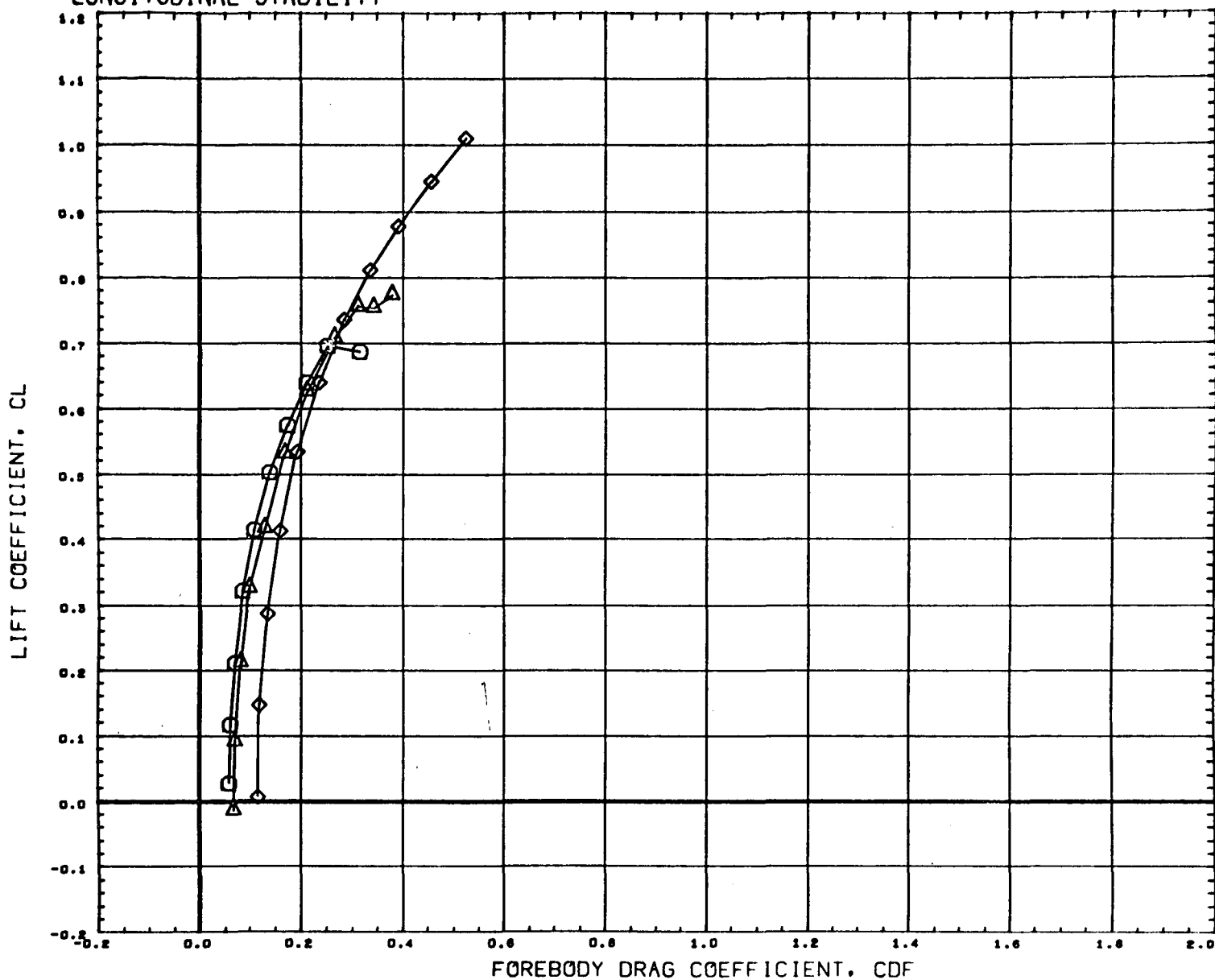
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LONGITUDINAL STABILITY

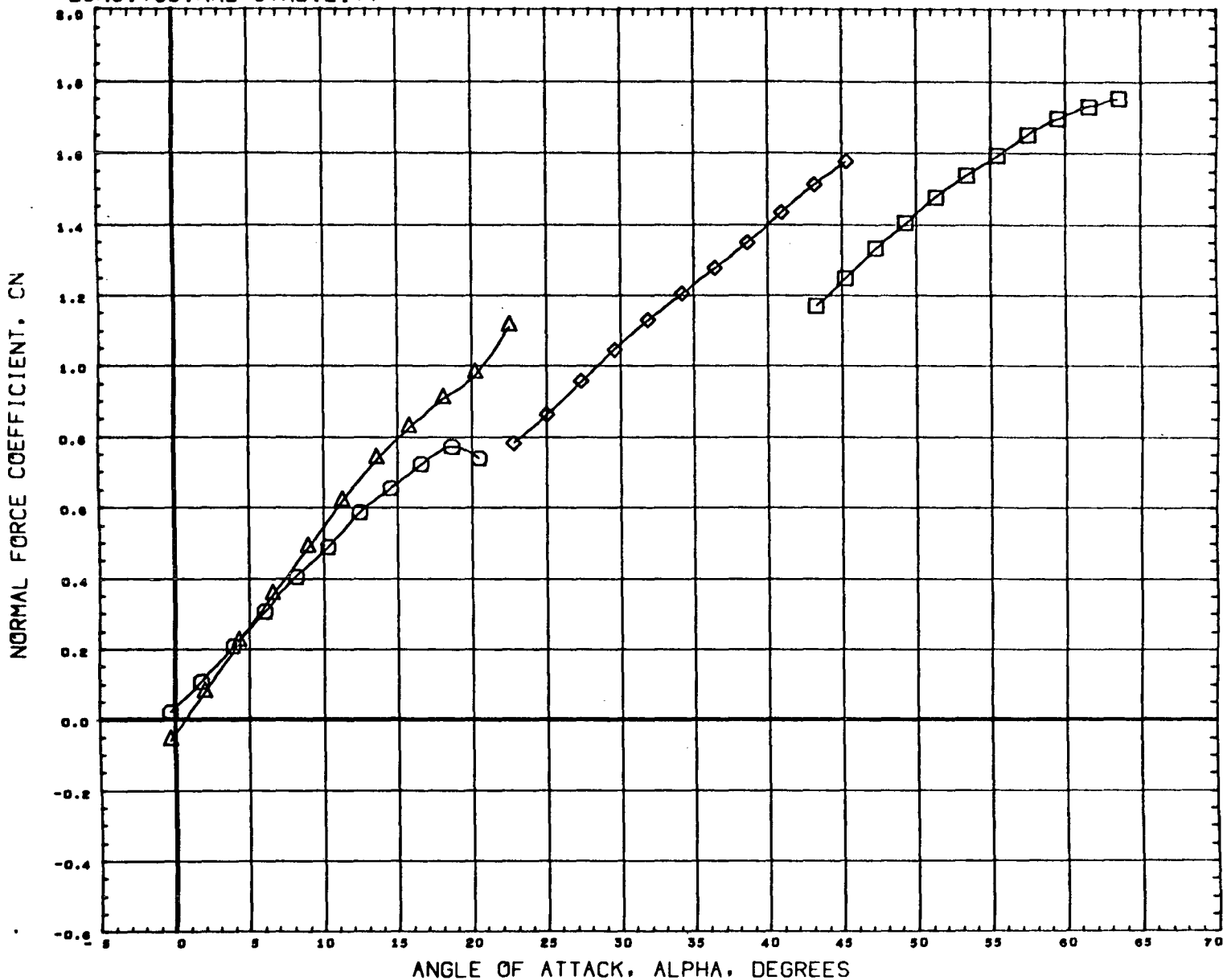


SYMBOL	MACH	PARAMETRIC VALUES		
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△	0.906	RUDFLR	30.000	
◇	1.201			

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LREF	4.5060	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
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DATA HIST. CODE GC*6

LONGITUDINAL STABILITY

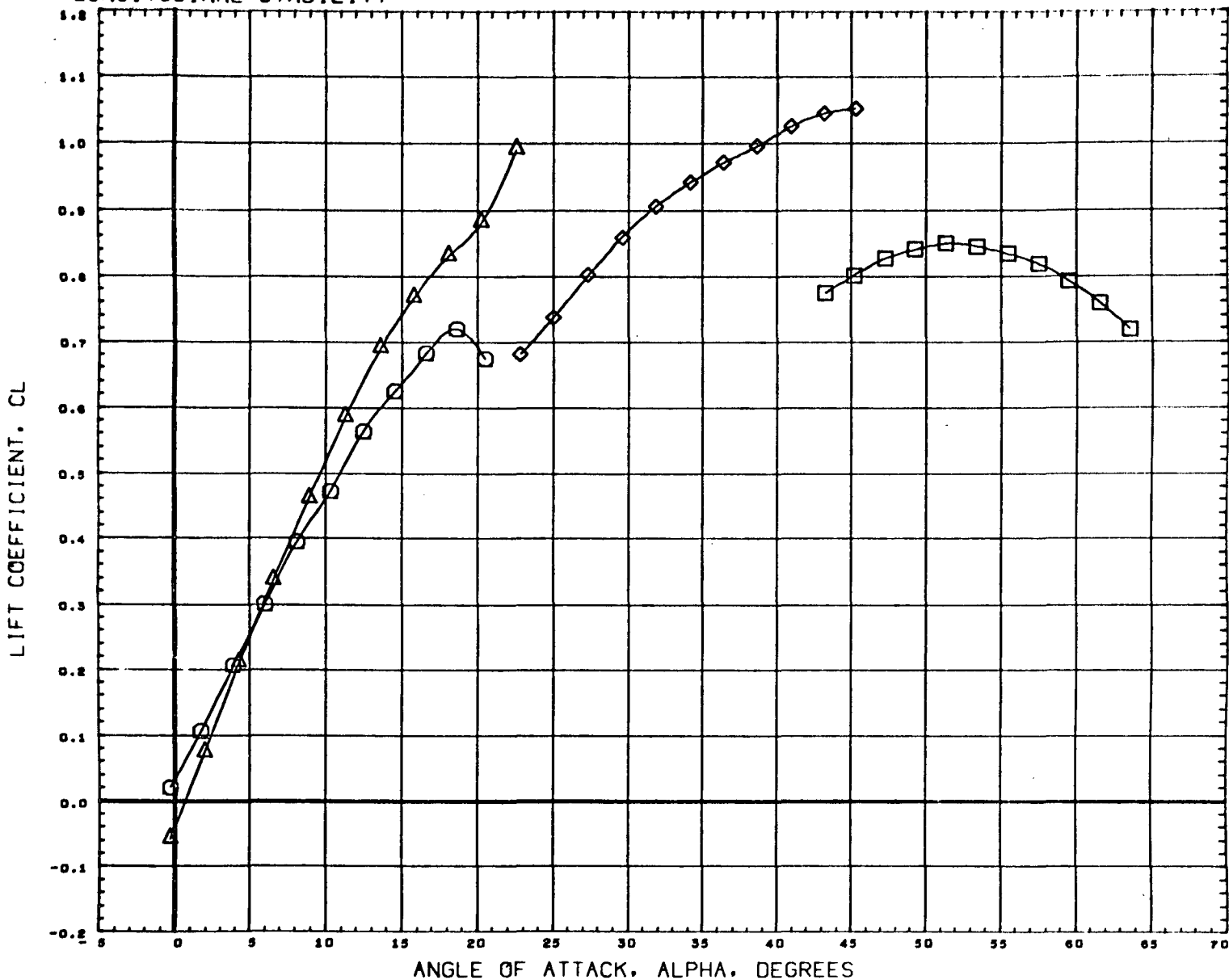


SYMBOL	MACH	PARAMETRIC VALUES		
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◇	1.937			
□	4.959			

DATA HIST. CODE *666

REFERENCE INFORMATION		
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LREF	4.3060	IN.
BREF	3.6550	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY



ANGLE OF ATTACK, ALPHA, DEGREES

SYMBOL	MACH	PARAMETRIC VALUES			
○	0.595	BETA	0.000	RUDDER	0.000
△	1.195	RUDFLR	30.000		
◇	1.937				
□	4.959				

REFERENCE INFORMATION		
SREF	14.6836	30. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRF	1.4821	IN.
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SCALE	0.0034	

DATA HIST. CODE *GGC

M513-MSFC MODELAR12161-2

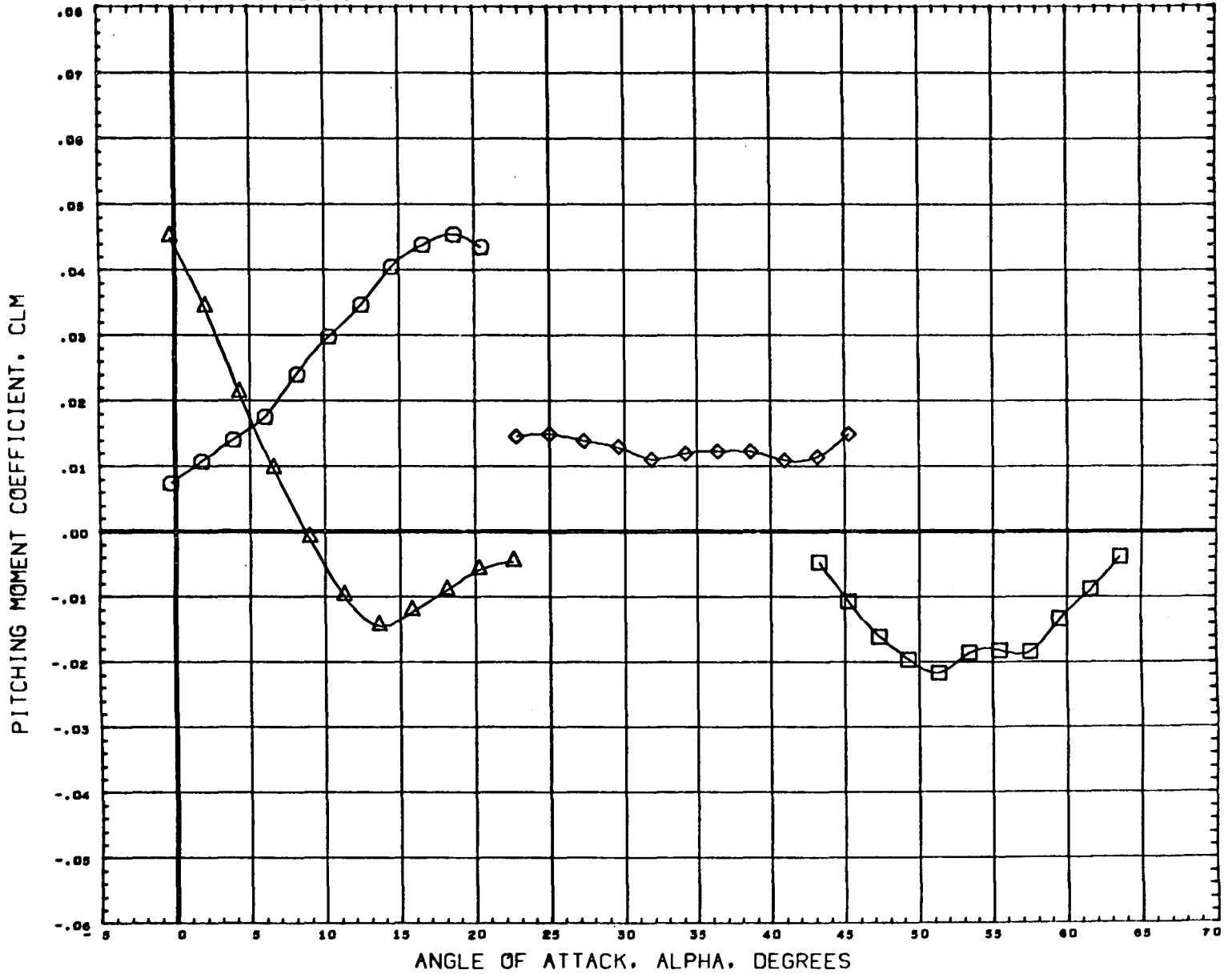
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18 MAR 72

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LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	0.595	BETA	0.000	RUDDER	0.000
△	1.195	RUDFLR	30.000		
◇	1.957				
□	4.959				

REFERENCE INFORMATION		
SREF	14.6836	80. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
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DATA HIST. CODE *GGC

M513-MSFC MODELAR1216I-2

B5CW11AF2S1V7E2C3 (C53081)

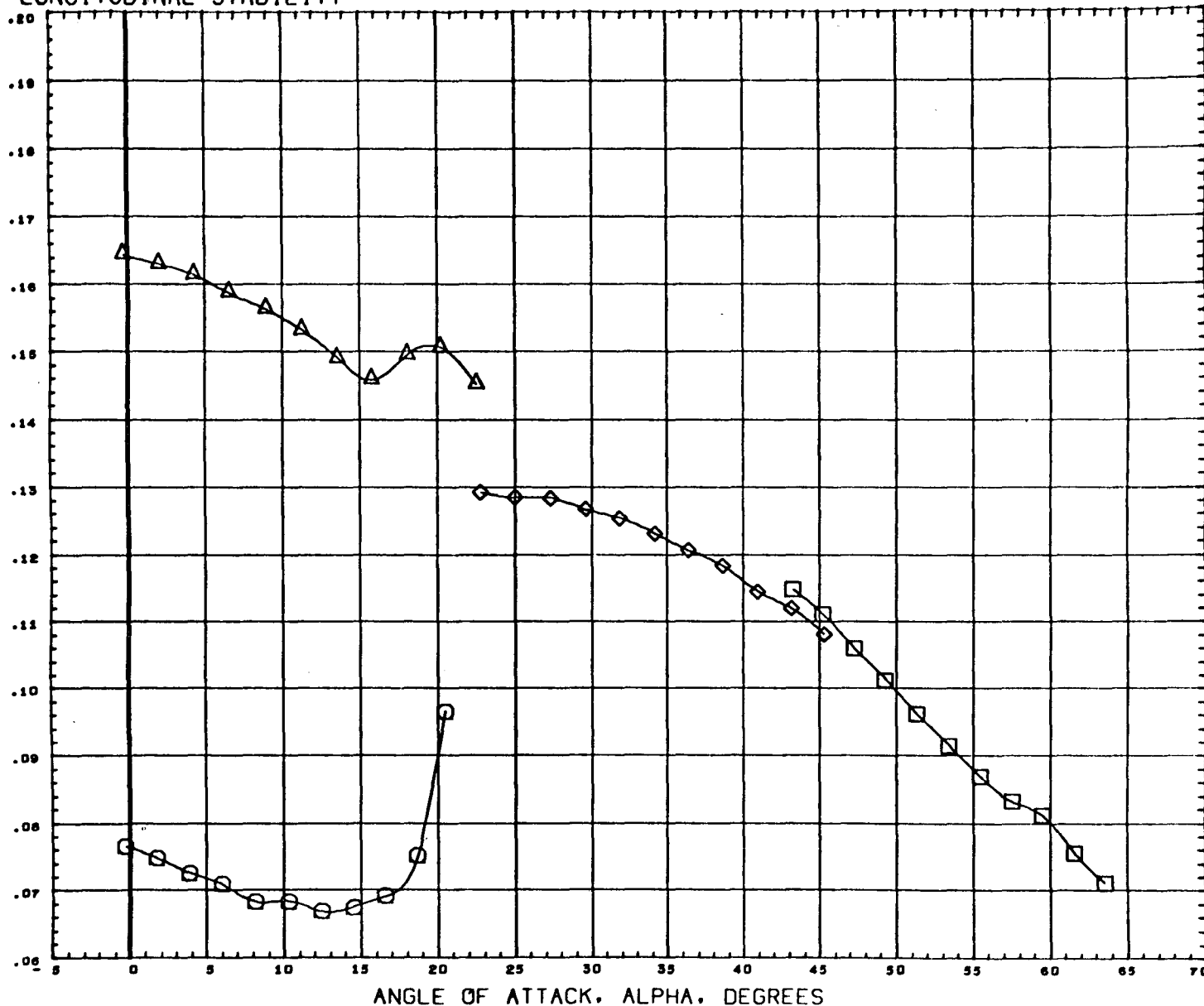
18 MAR 72

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AXIAL FORCE CORRECTED TO FREE STREAM PRESSURE AT THE BASE REGION. CAT

LONGITUDINAL STABILITY

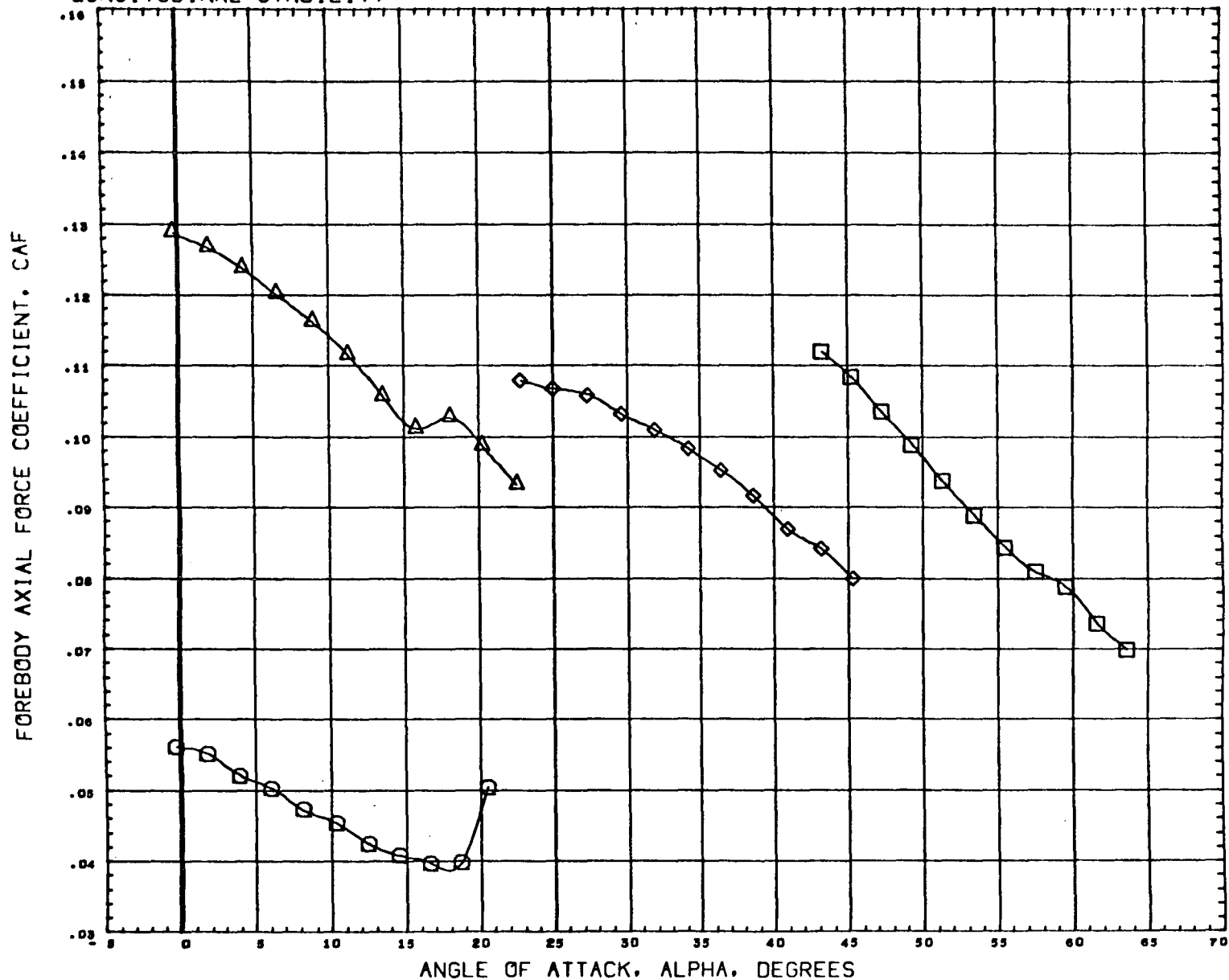


SYMBOL	MACH	PARAMETRIC VALUES			
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△	1.195	RUDFLR	30.000		
◇	1.957				
□	4.959				

DATA HIST. CODE *66C

REFERENCE INFORMATION		
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LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
○	0.595	BETA	0.000	RUDDER 0.000
△	1.195	RUDFLR	30.000	
◇	1.957			
□	4.959			

REFERENCE INFORMATION		
SREF	14.6836	sq. in.
LREF	4.5080	in.
BREF	5.6550	in.
XMRP	1.4821	in.
YMRP	0.0000	in.
ZMRP	0.0000	in.
SCALE	0.0034	

DATA HIST. CODE *GGC

M513-MSFC MODELAR1216I-2

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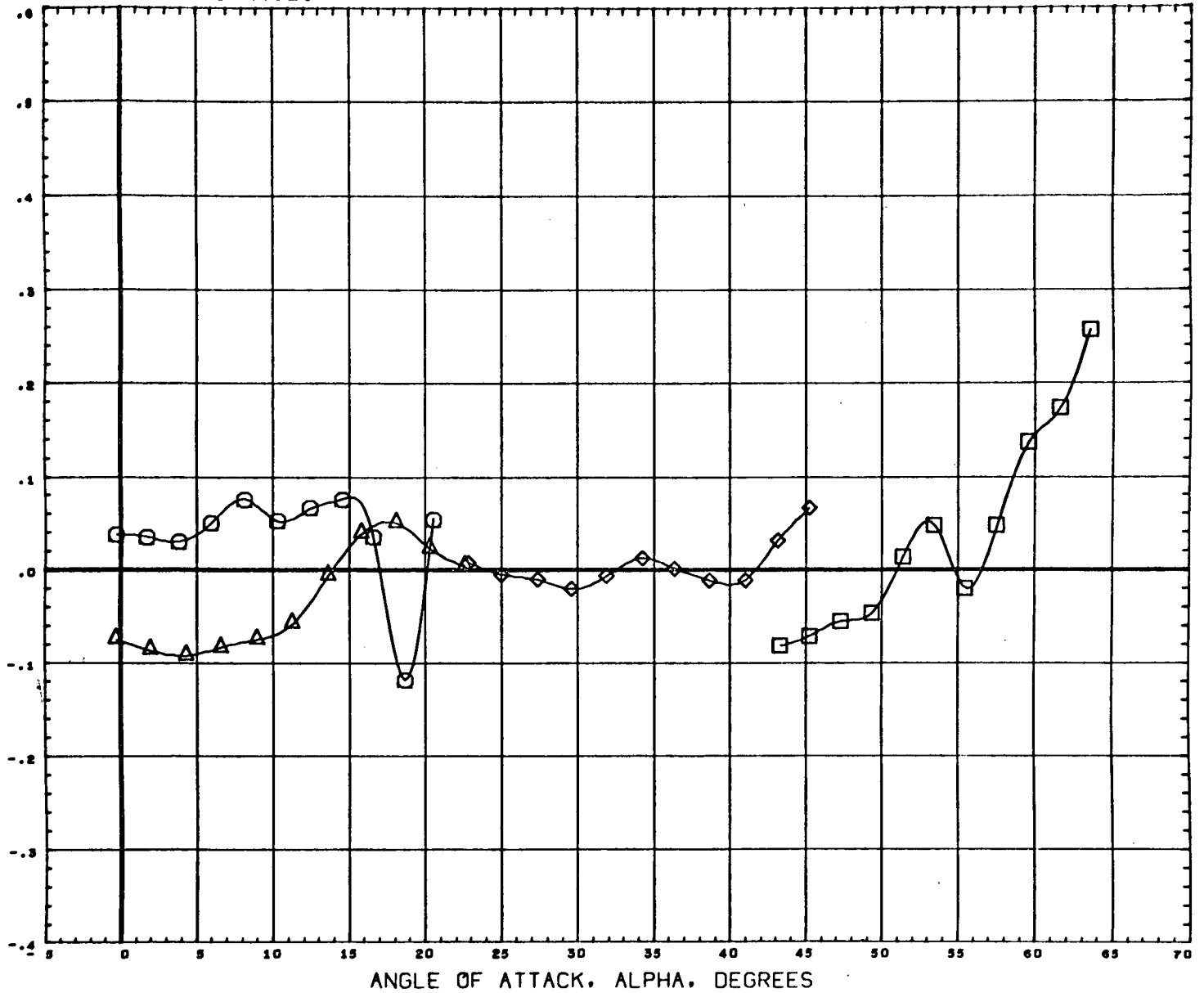
18 MAR 72

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LONGITUDINAL STABILITY

STATIC LONGITUDINAL STABILITY DERIVATIVE, D(CLM/CN)



SYMBOL	MACH	PARAMETRIC VALUES			
○	0.595	BETA	0.000	RUDDER	0.000
△	1.195	RUDFLR	30.000		
◇	1.957				
□	4.959				

DATA HIST. CODE #GGC

REFERENCE INFORMATION		
SREF	14.6636	80. IN.
LREF	4.5080	IN.
BREF	5.6350	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

M513-MSFC MODELAR12161-2

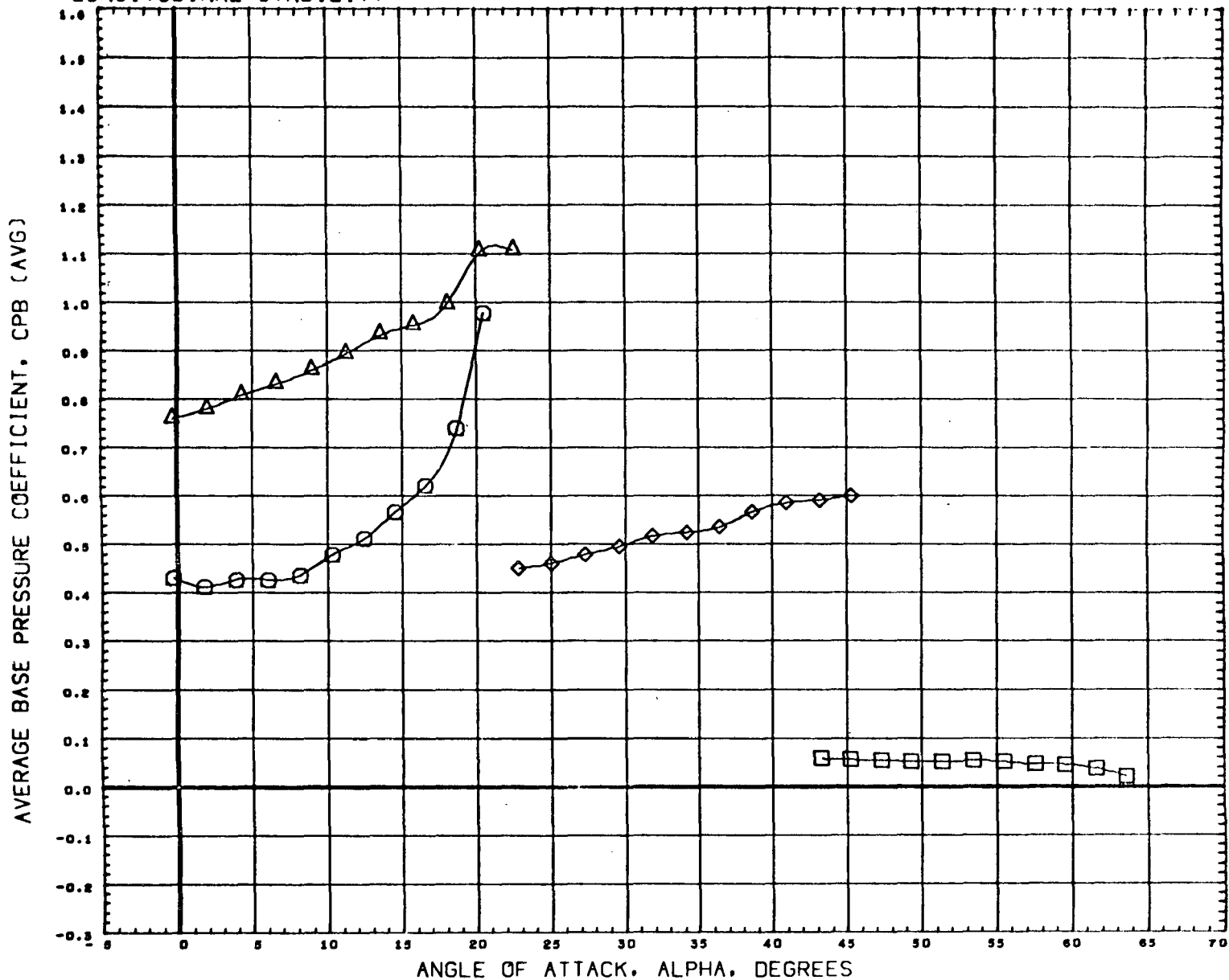
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LONGITUDINAL STABILITY

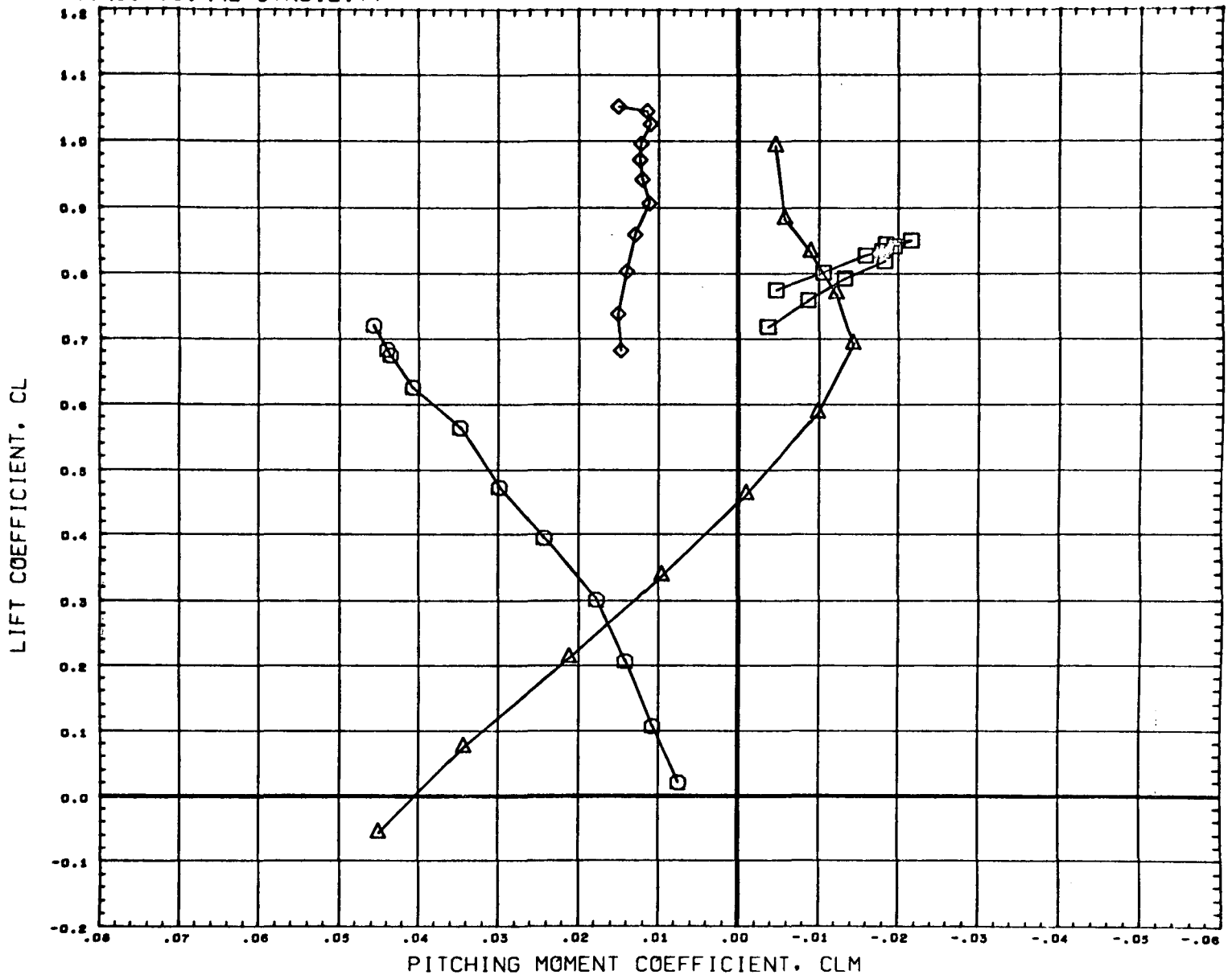


SYMBOL	MACH	PARAMETRIC VALUES		
○	0.595	BETA	0.000	RUDDER
△	1.195	RUDDLR	30.000	0.000
◇	1.957			
□	4.959			

DATA HIST. CODE *66C

REFERENCE INFORMATION		
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BREF	5.6550	IN.
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YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY

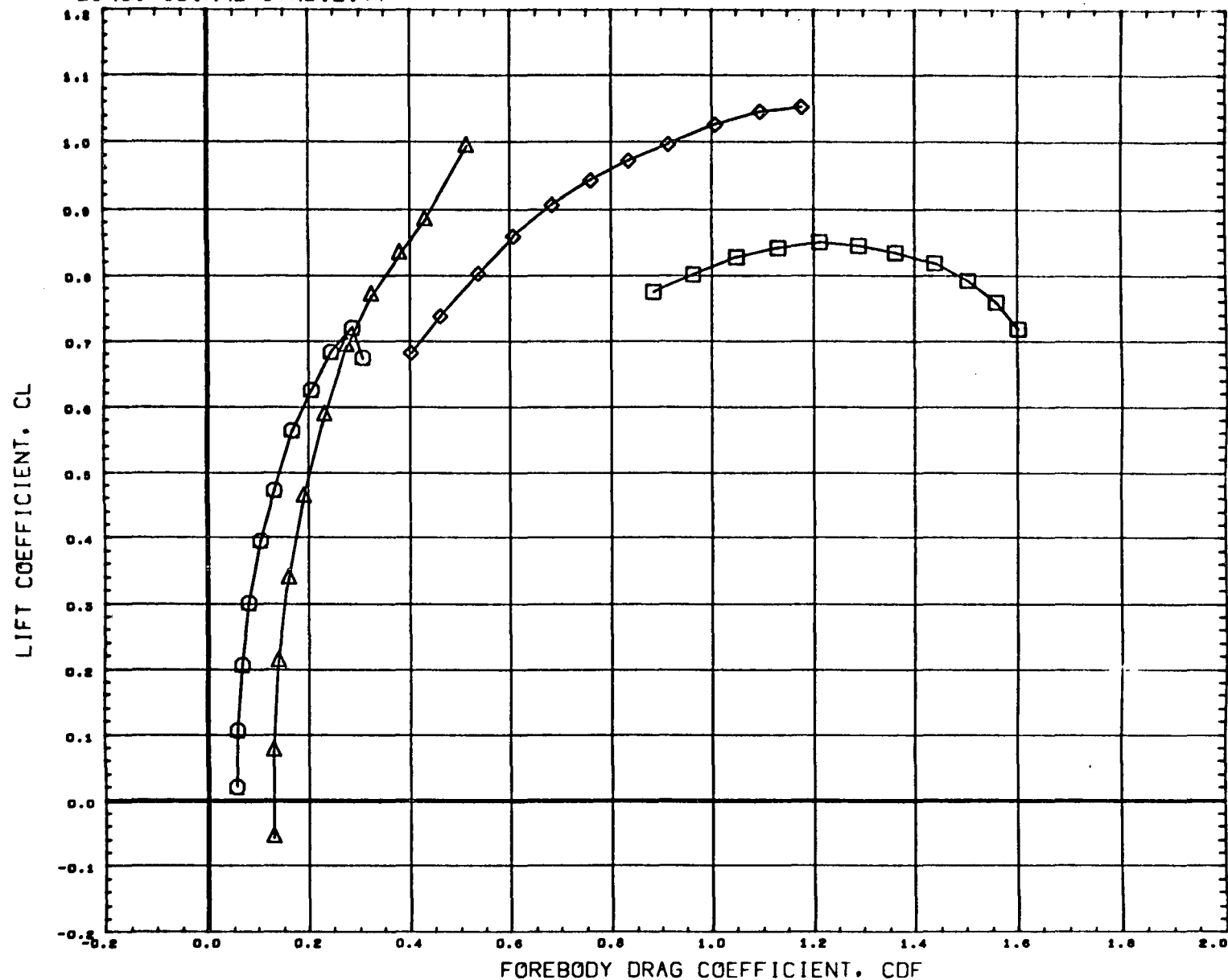


YMBOL	MACH	PARAMETRIC VALUES		
○	0.595	BETA	0.000	RUDDER
△	1.195	RUDFLR	30.000	0.000
◇	1.957			
□	4.959			

REFERENCE INFORMATION		
SREF	14.6836	SQ. IN.
LREF	4.5080	IN.
BREF	9.6550	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE *GGC

LONGITUDINAL STABILITY

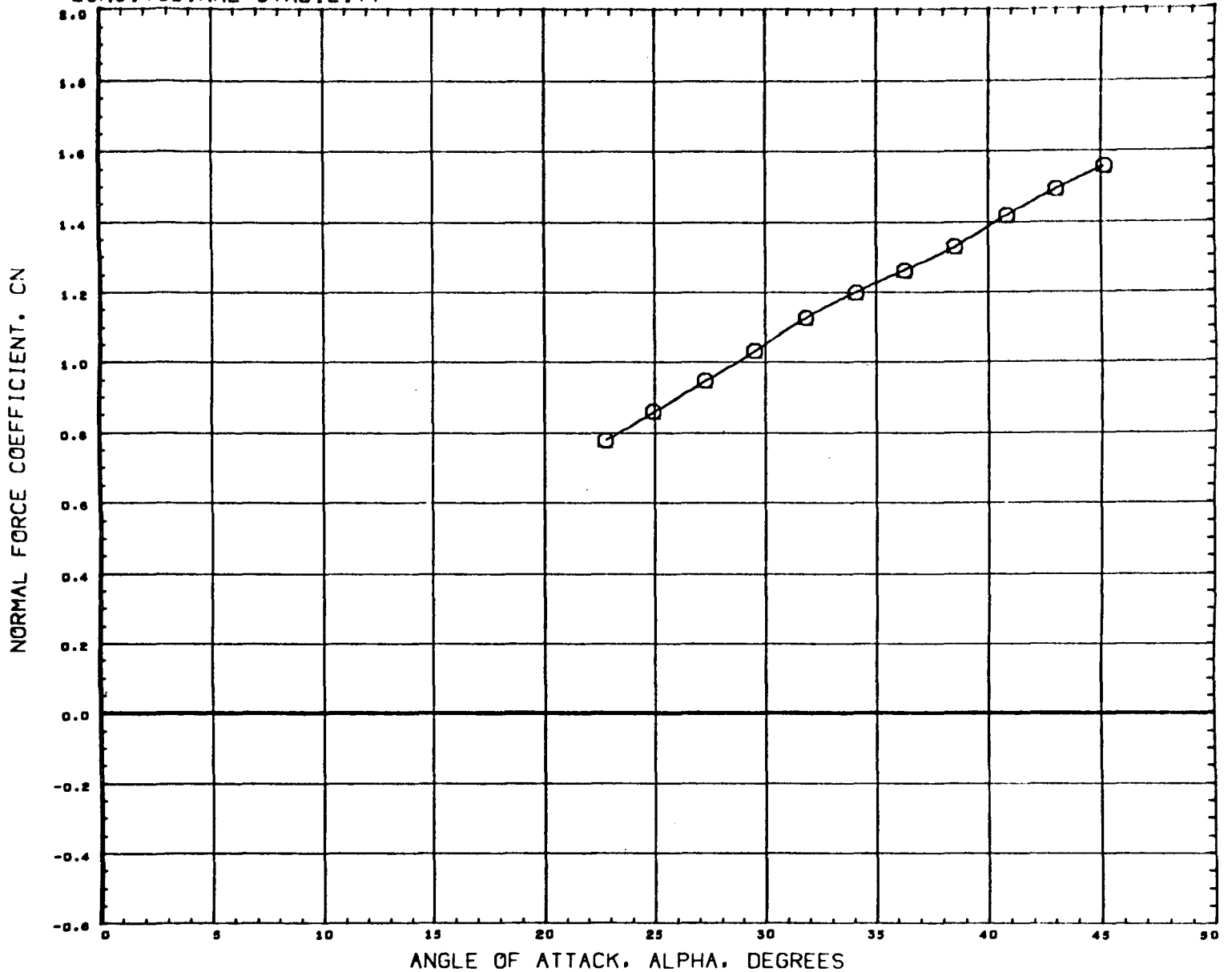


SYMBOL	MACH	PARAMETRIC VALUES		
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△	1.195	RUDFLR	30.000	0.000
◇	1.957			
□	4.959			

DATA HIST. CODE *66C

REFERENCE INFORMATION		
SREF	14.6636	sq. in.
LREF	4.5080	in.
BREF	9.6550	in.
XMRP	1.4621	in.
YMRP	0.0000	in.
ZMRP	0.0000	in.
SCALE	0.0034	

LONGITUDINAL STABILITY



SYMBOL \bigcirc MACH 1.980 BETA 0.000 RUDDER 0.000
 RUDDLER 30.000

REFERENCE INFORMATION
 SREF 14.6836 SQ. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
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 SCALE 0.0034

DATA HIST. CODE GC

M513-MSFC MODELAR12161-2

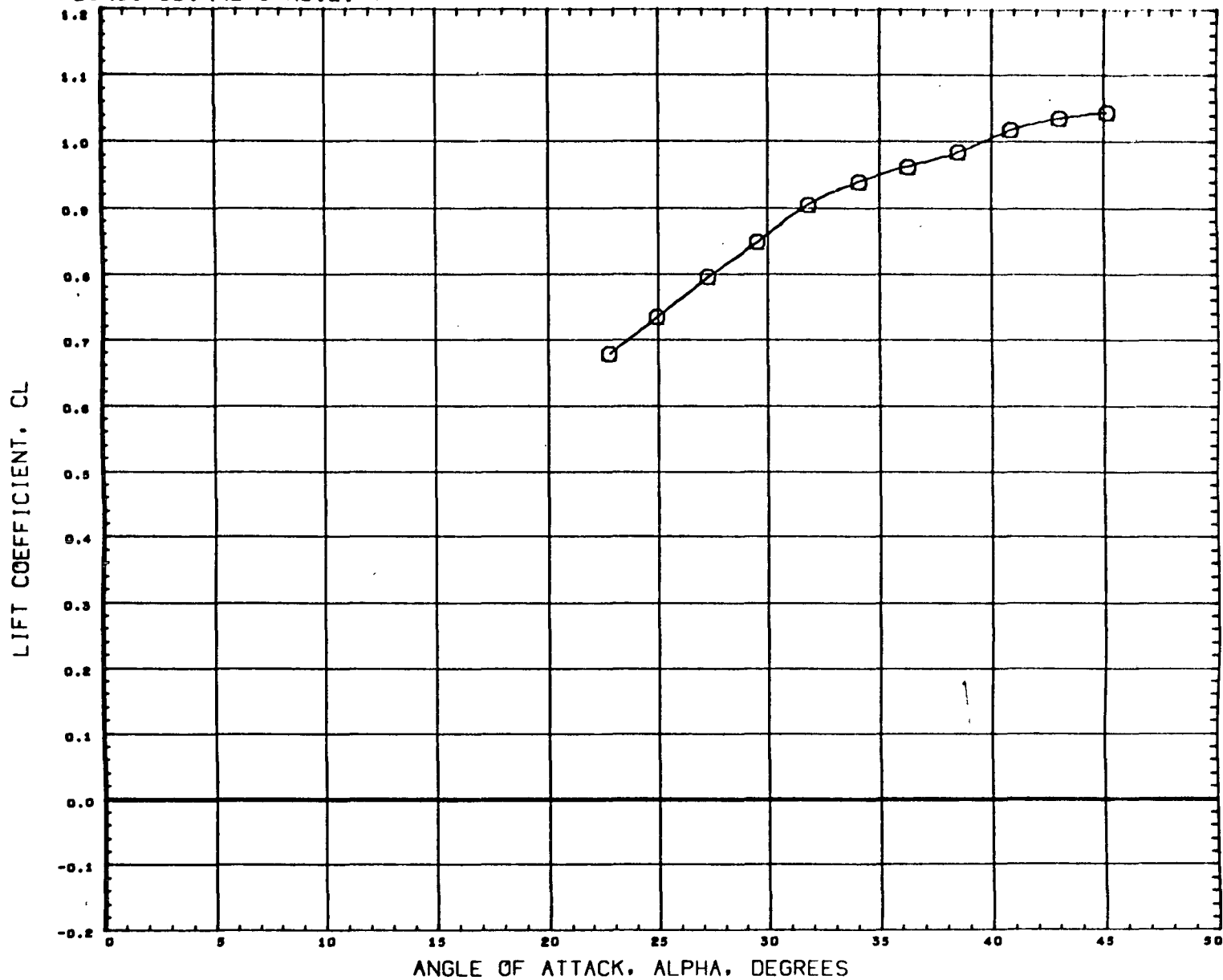
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LONGITUDINAL STABILITY



SYMBOL \bigcirc HACH 1.960
 PARAMETRIC VALUES
 BETA 0.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 90 IN.
 LREF 4.5080 IN.
 BREF 9.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

M513-MSFC MODELAR12161-2

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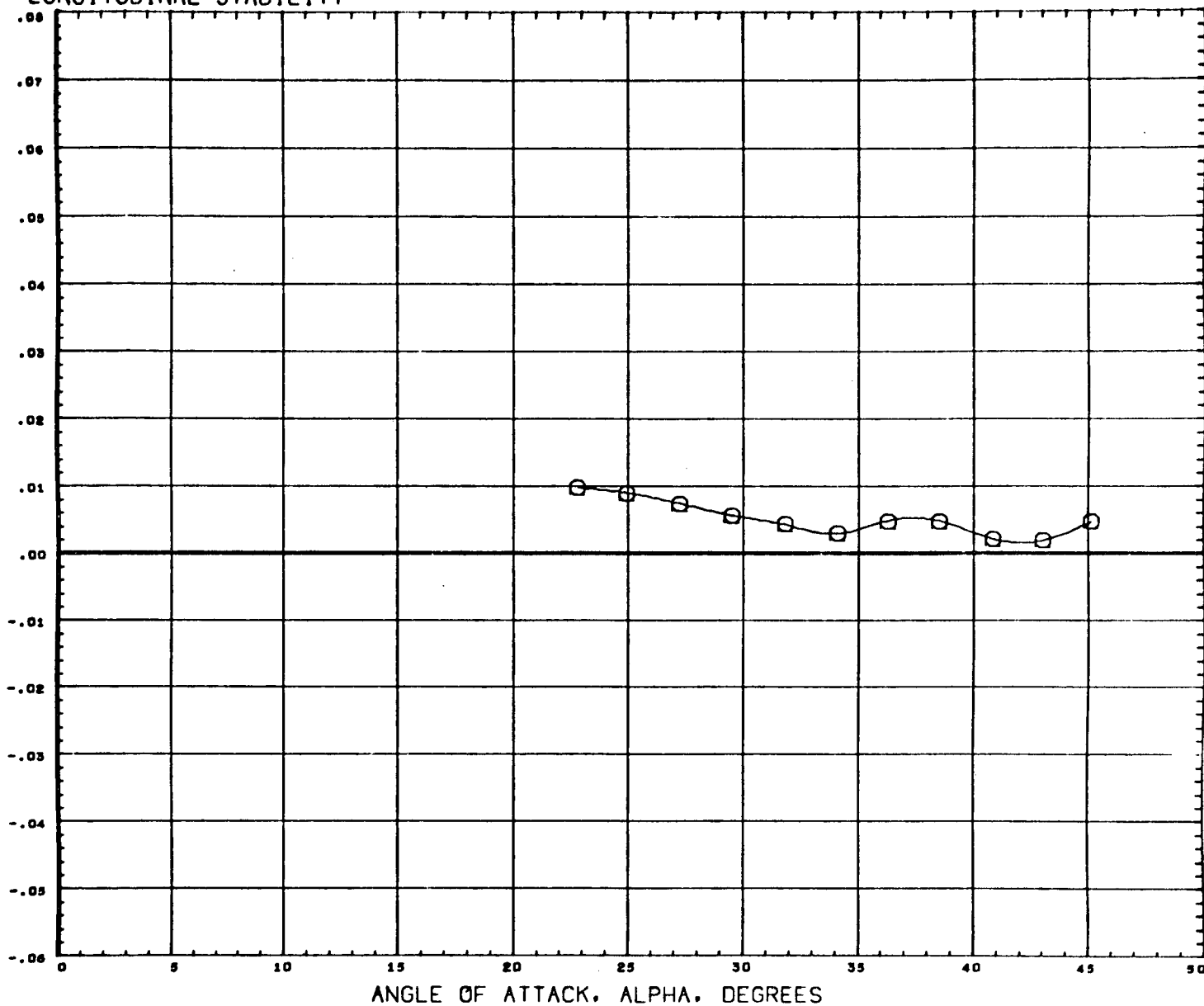
18 MAR 72

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LONGITUDINAL STABILITY

PITCHING MOMENT COEFFICIENT, CLM



ANGLE OF ATTACK, ALPHA, DEGREES

SYMBOL \square MACH 1.960 BETA 0.000 RUDDER 0.000
 RUDDER 30.000

REFERENCE INFORMATION
 SREF 14.6836 SQ. IN.
 LREF 4.3080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
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DATA HIST. CODE GC

M513-MSFC MODELAR1216I-2

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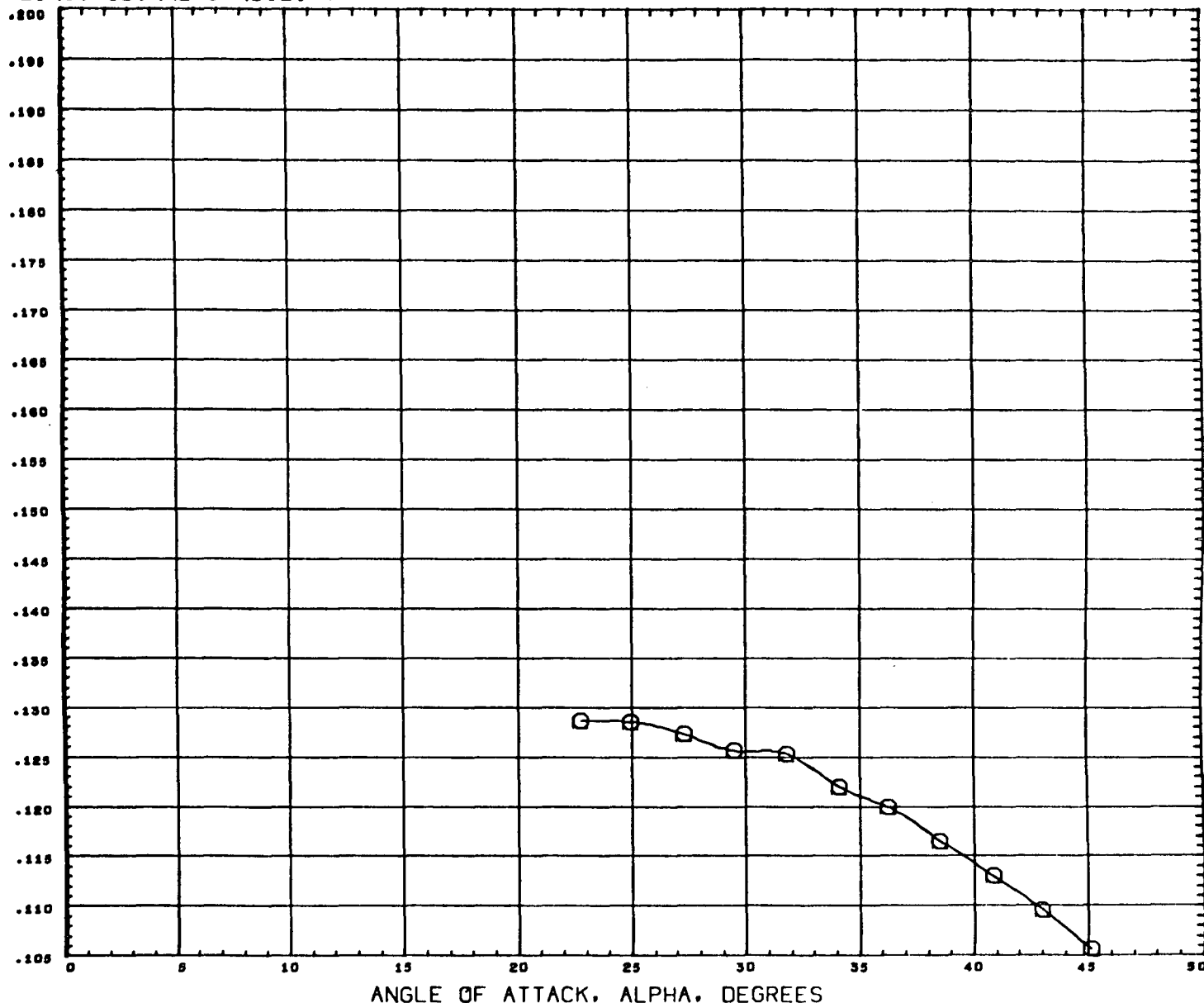
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AXIAL FORCE CORRECTED TO FREE STREAM PRESSURE AT THE BASE REGION, CAT

LONGITUDINAL STABILITY



ANGLE OF ATTACK, ALPHA, DEGREES

SYMBOL MACH PARAMETRIC VALUES
O 1.960 BETA 0.000 RUDDER 0.000
RUDFLR 30.000

REFERENCE INFORMATION
SREF 14.6836 99. IN.
LREF 4.3080 IN.
BREF 5.6350 IN.
XMRP 1.4821 IN.
YMRP 0.0000 IN.
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SCALE 0.0034

DATA HIST. CODE 6C

M513-MSFC MODELAR1216I-2

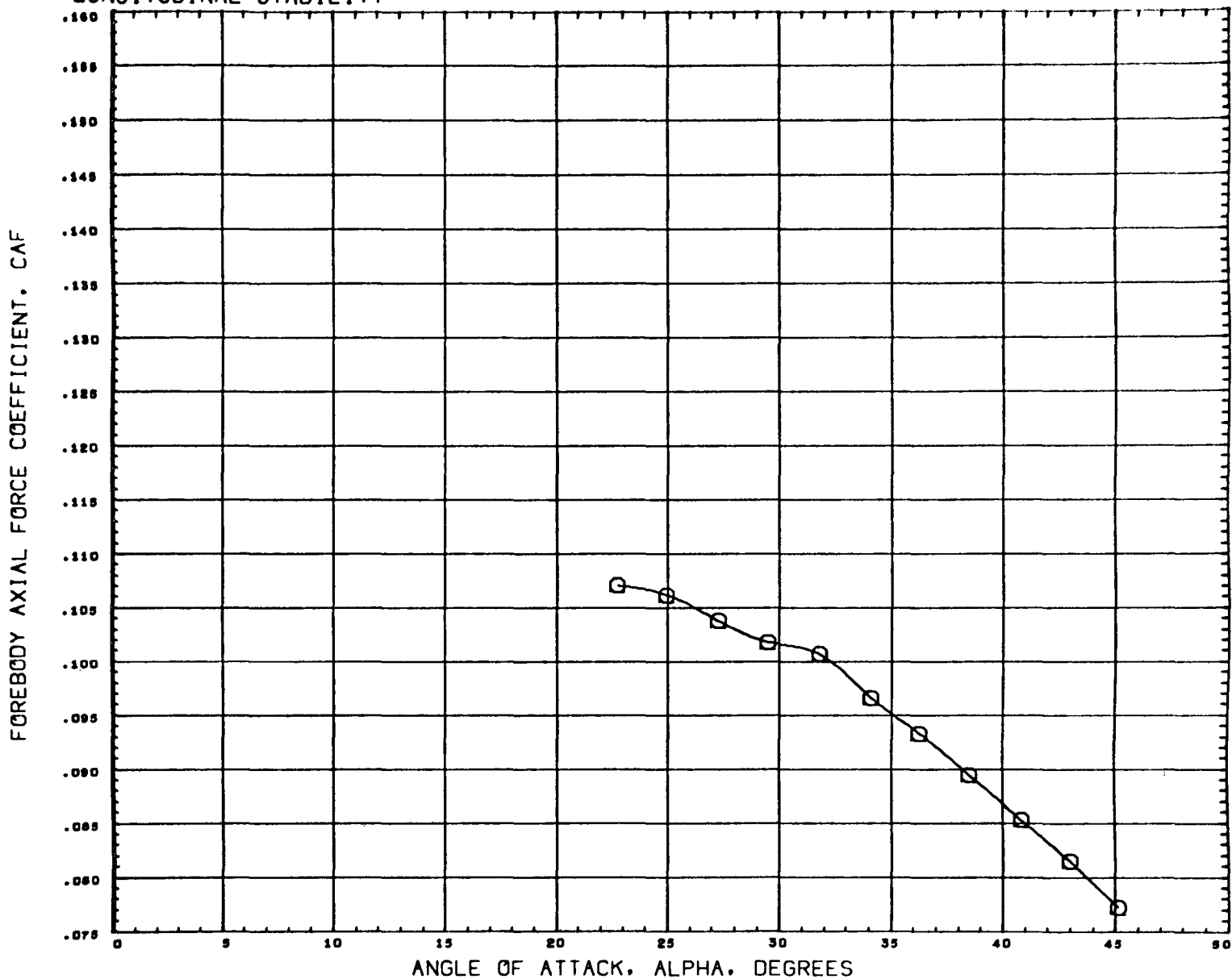
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LONGITUDINAL STABILITY



SYMBOL \square MACH 1.960 BETA 0.000 RUDDER 0.000
 PARAMETRIC VALUES
 RUDDLR 30.000

REFERENCE INFORMATION
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 LREF 4.5080 IN.
 SREF 5.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
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DATA HIST. CODE 6C

M513-MSFC MODELAR12161-2

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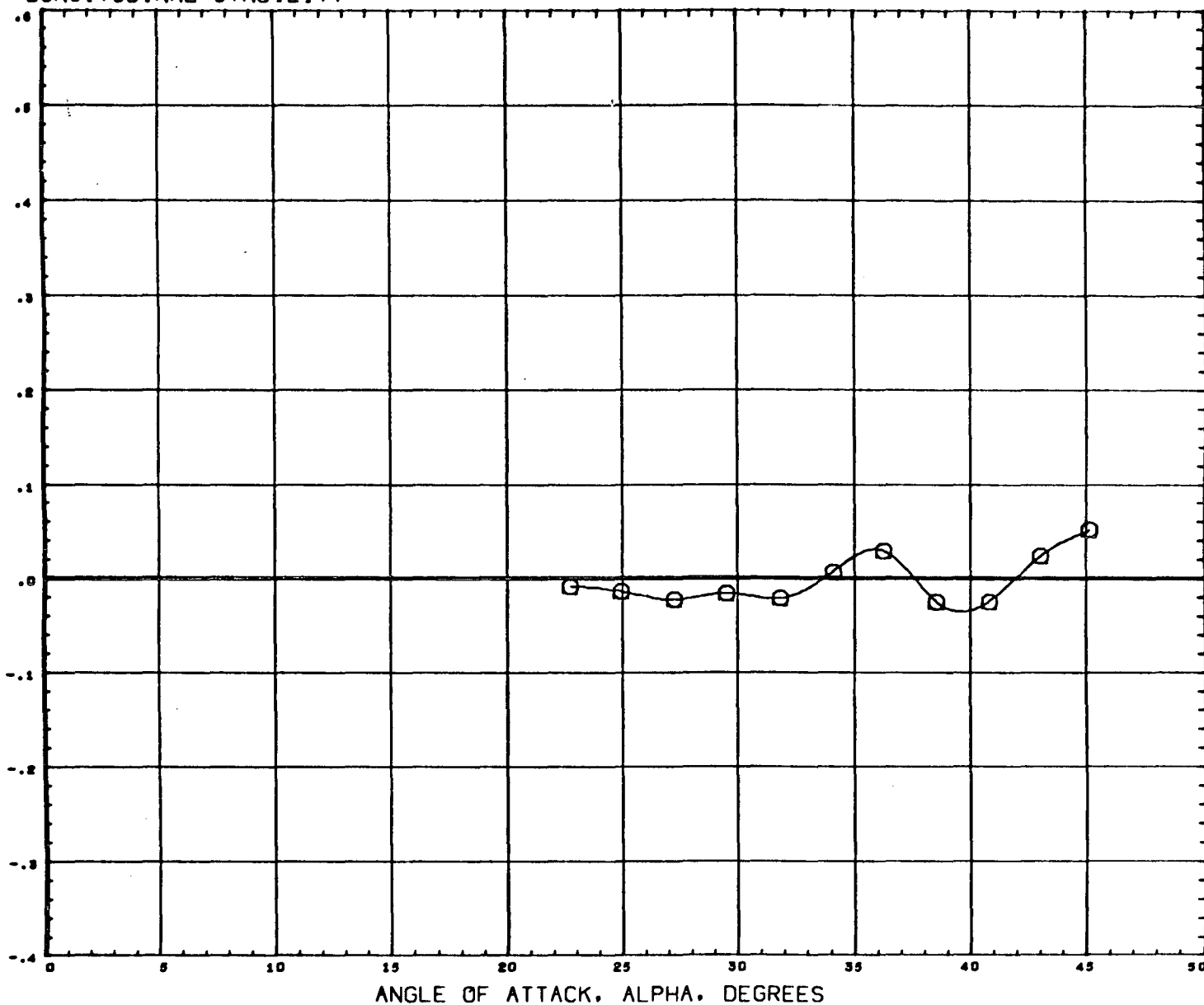
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LONGITUDINAL STABILITY

STATIC LONGITUDINAL STABILITY DERIVATIVE, D(CLM/CN)



SYMBOL MACH 1.960 BETA 0.000 RUDDER 0.000
 O RUDFLR 30.000

DATA HIST. CODE GC

REFERENCE INFORMATION
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 ZMRP 0.0000 IN.
 SCALE 0.0034

M513-MSFC MODELAR1216I-2

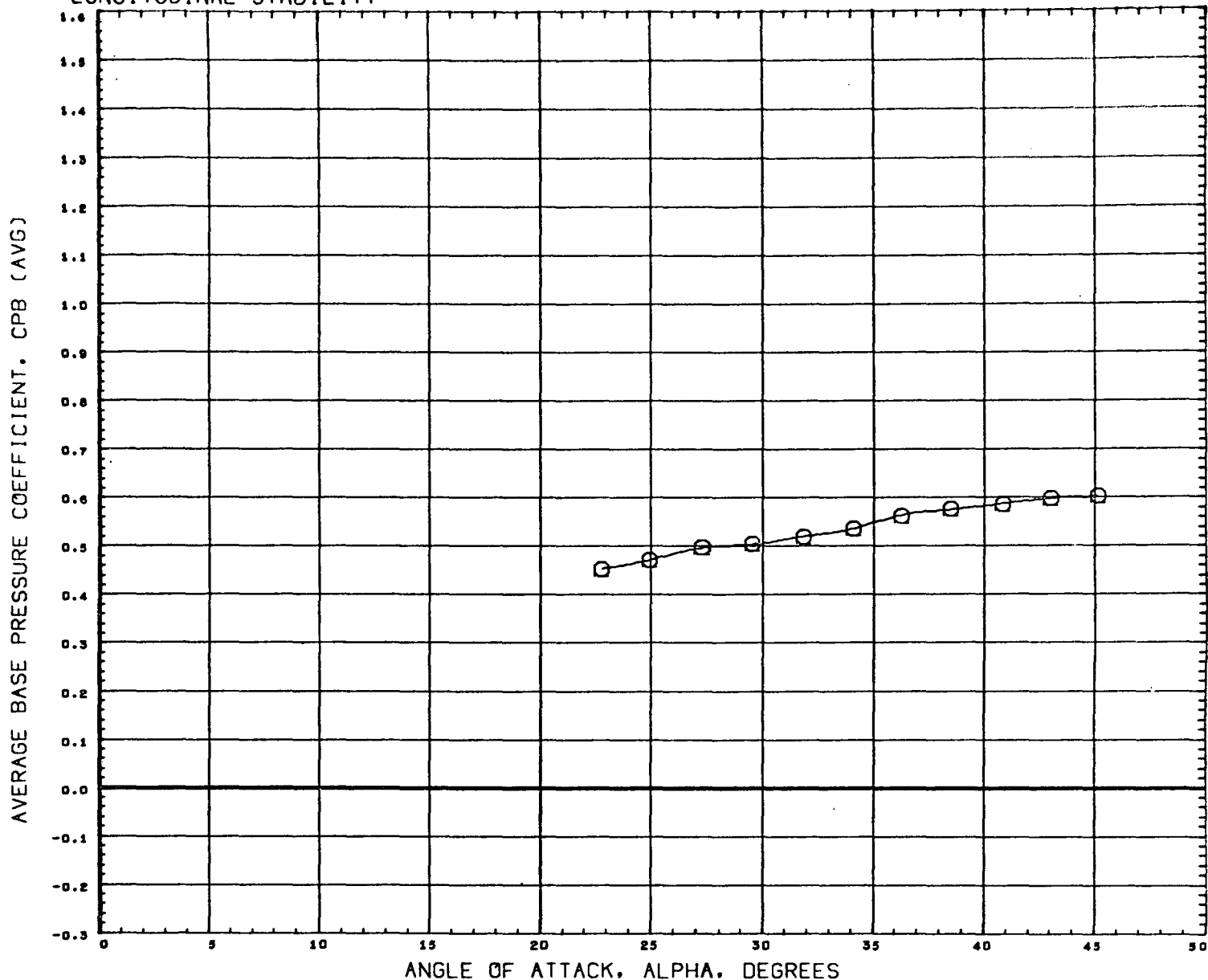
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LONGITUDINAL STABILITY



SYMBOL \bigcirc MACH 1.960
 PARAMETRIC VALUES
 BETA 0.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
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DATA HIST. CODE GC

M513-MSFC MODELAR12161-2

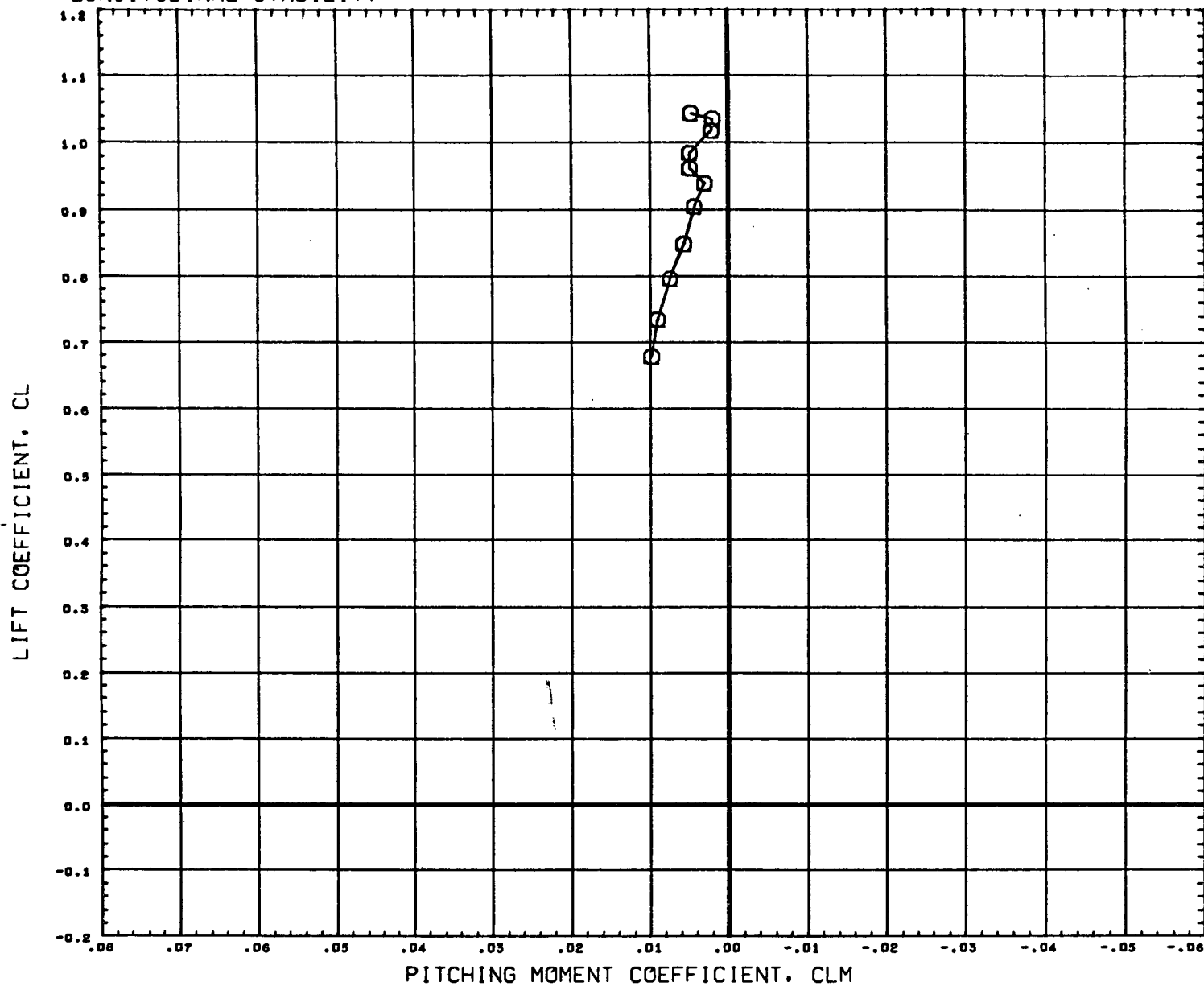
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LONGITUDINAL STABILITY



SYMBOL \bigcirc MACH 1.960 BETA 0.000 RUDDER 0.000
 RUDFLR 30.000

DATA HIST. CODE GC

REFERENCE INFORMATION
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 SCALE 0.0034

M513-MSFC MODELAR1216I-2

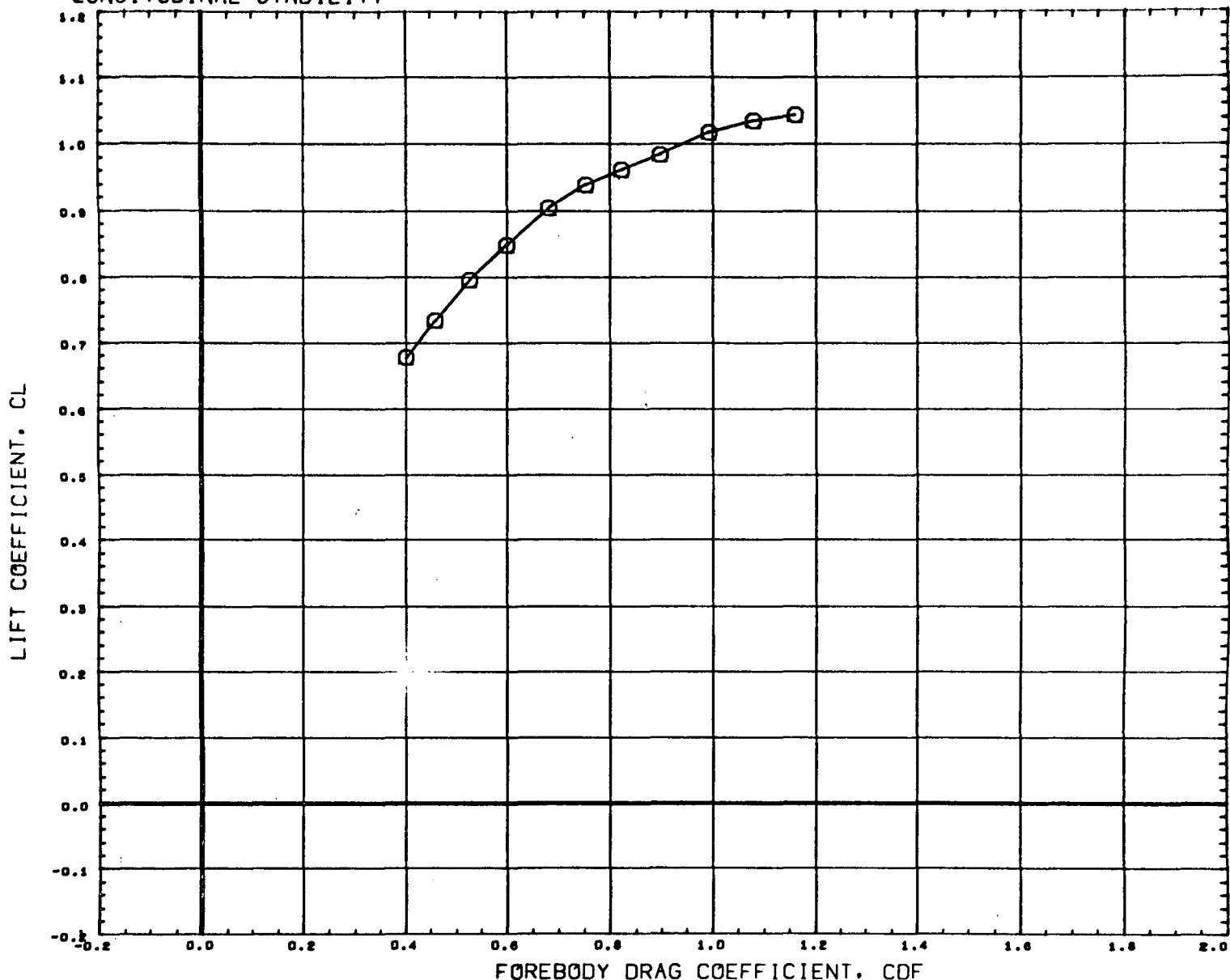
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LONGITUDINAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 ○ 1.980 BETA 0.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 SQ. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
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 SCALE 0.0034

DATA HIST. CODE GC

M513-MSFC MODELAR1216I-2

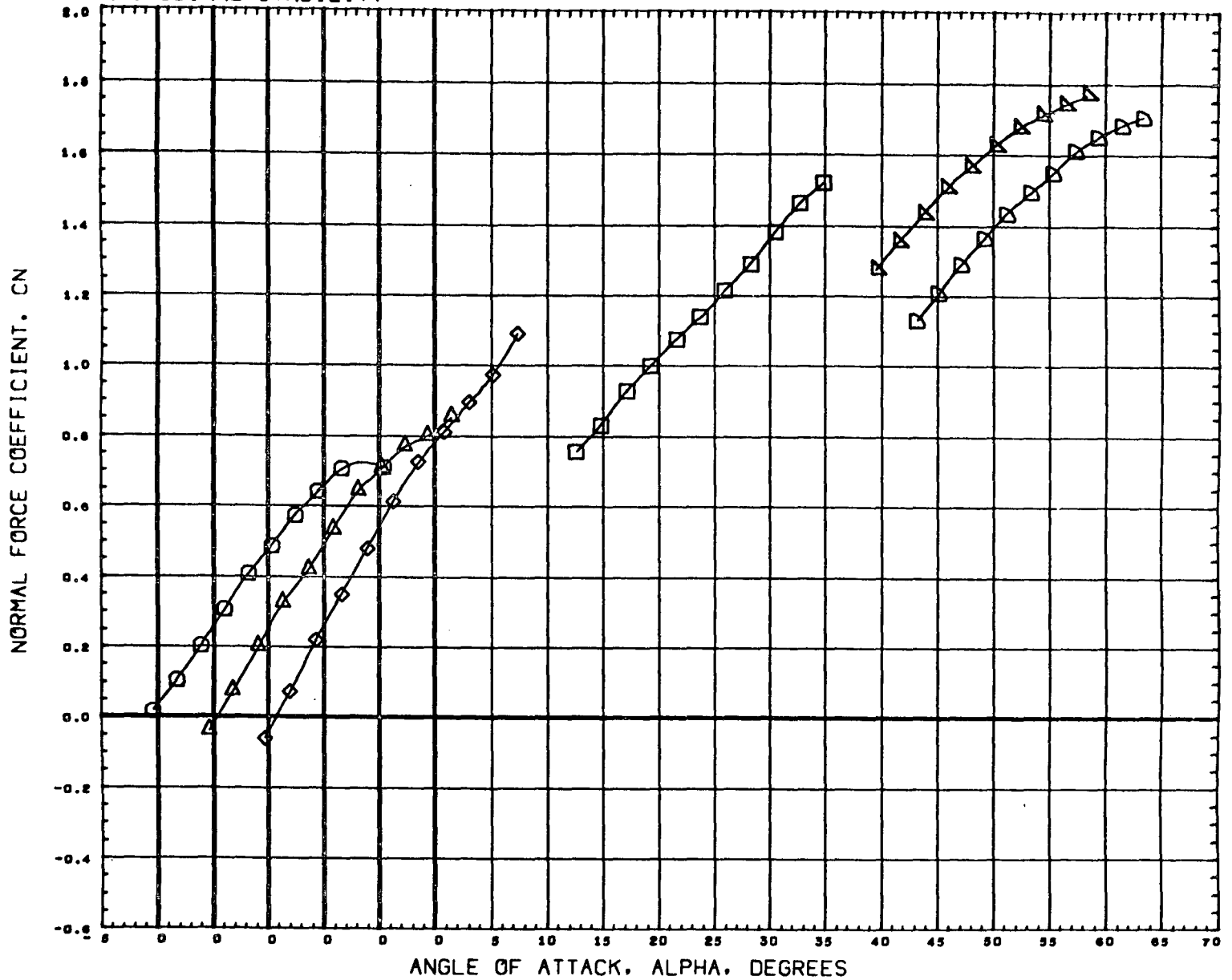
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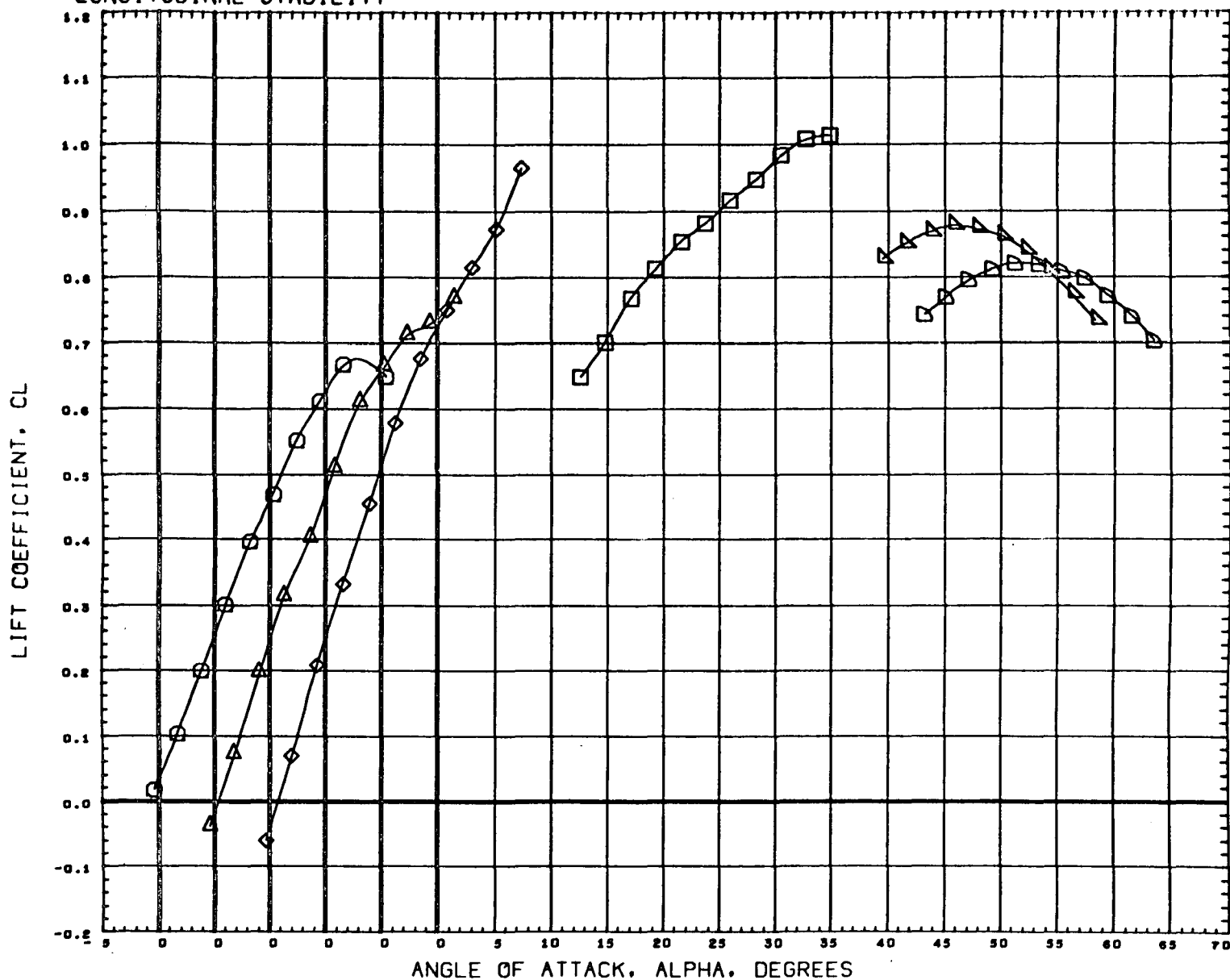
LONGITUDINAL STABILITY



SYMBOL ○ △ ◇ □ ◻	MACH	PARAMETRIC VALUES			
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	0.905	RUDFLR	30.000		
	1.197				
	1.959				
	3.479				
	4.959	DATA HIST. CODE	#GGC#G		

REFERENCE INFORMATION		
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YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
\square	0.598	BETA	0.000	RUDDER
\diamond	0.905	RUDDLR	30.000	0.000
\triangle	1.197			
∇	1.959			
\circ	3.479			
	4.959	DATA HIST. CODE	*GGC*G	

REFERENCE INFORMATION		
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YHRP	0.0000	IN.
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SCALE	0.0034	

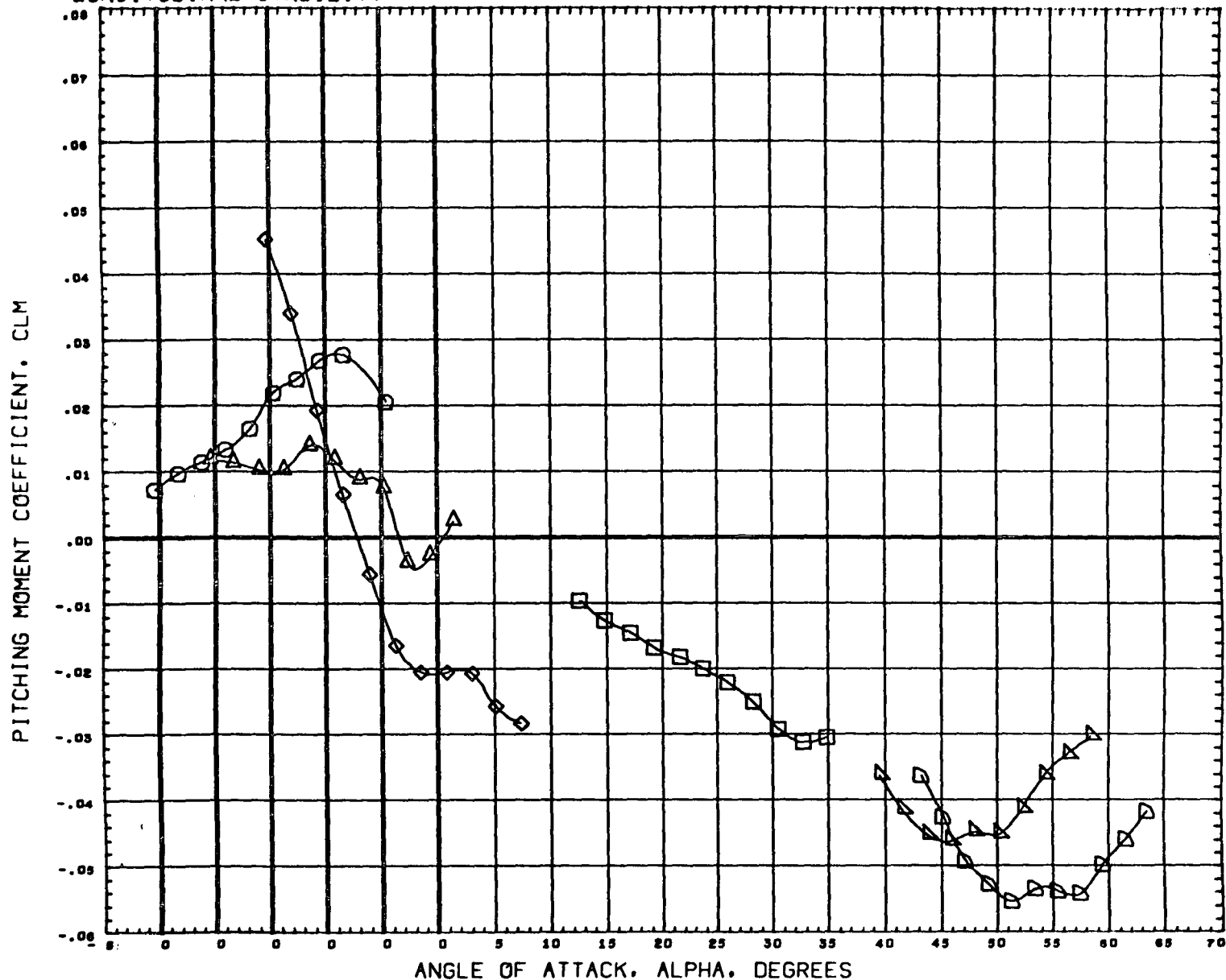
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(S53181) 18 MAR 72

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LONGITUDINAL STABILITY

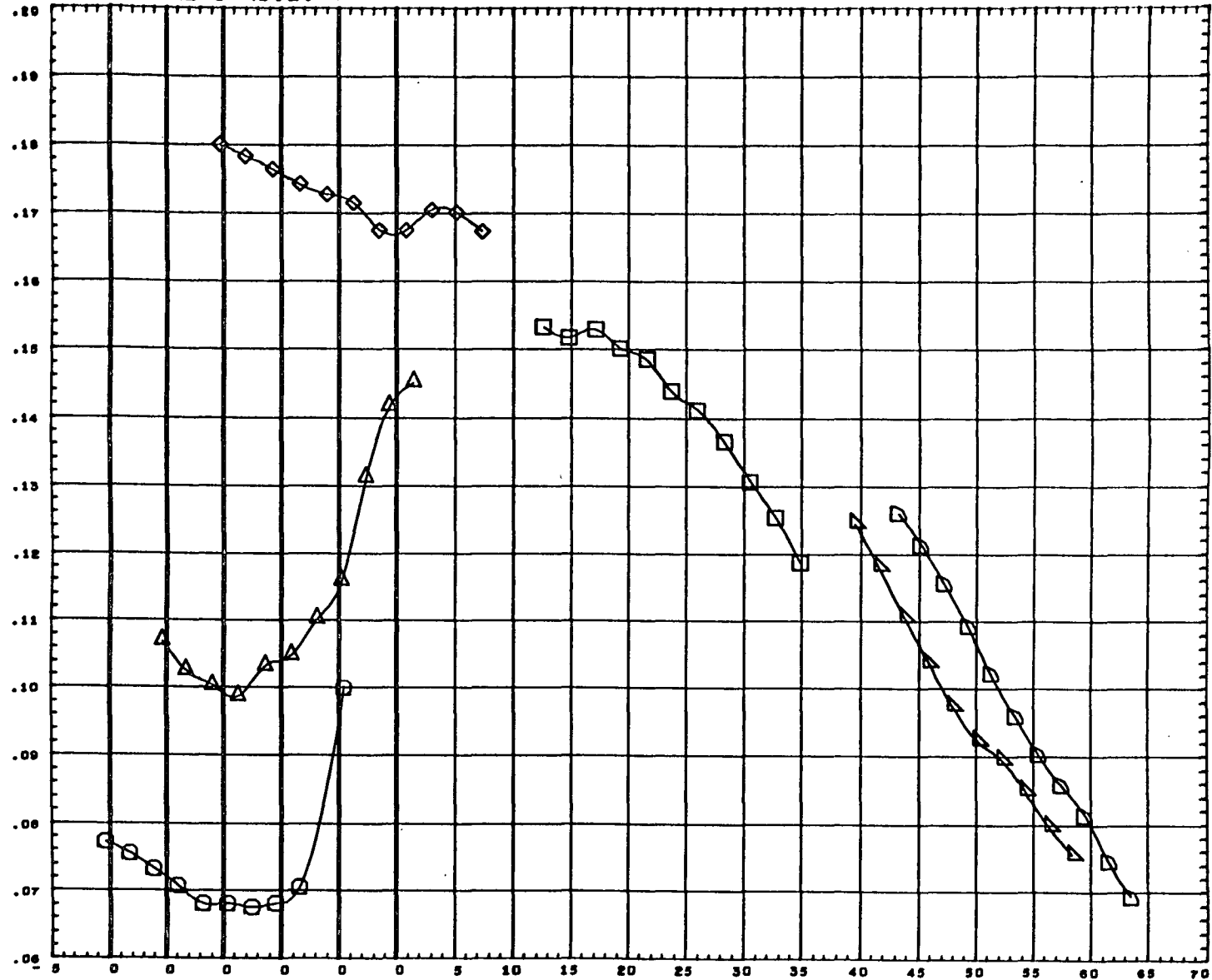


SYMBOL	MACH	PARAMETRIC VALUES
○	0.900	DETA 0.000 RUDDER 0.000
△	0.905	RUDFLR 30.000
◇	1.197	
□	1.959	
◇	3.479	
◇	4.959	DATA HIST. CODE *GGC*G

REFERENCE INFORMATION		
SREF	14.6836	30. IN.
LREF	4.9080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
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SCALE	0.0034	

AXIAL FORCE CORRECTED TO FREE STREAM PRESSURE AT THE BASE REGION, CA

LONGITUDINAL STABILITY

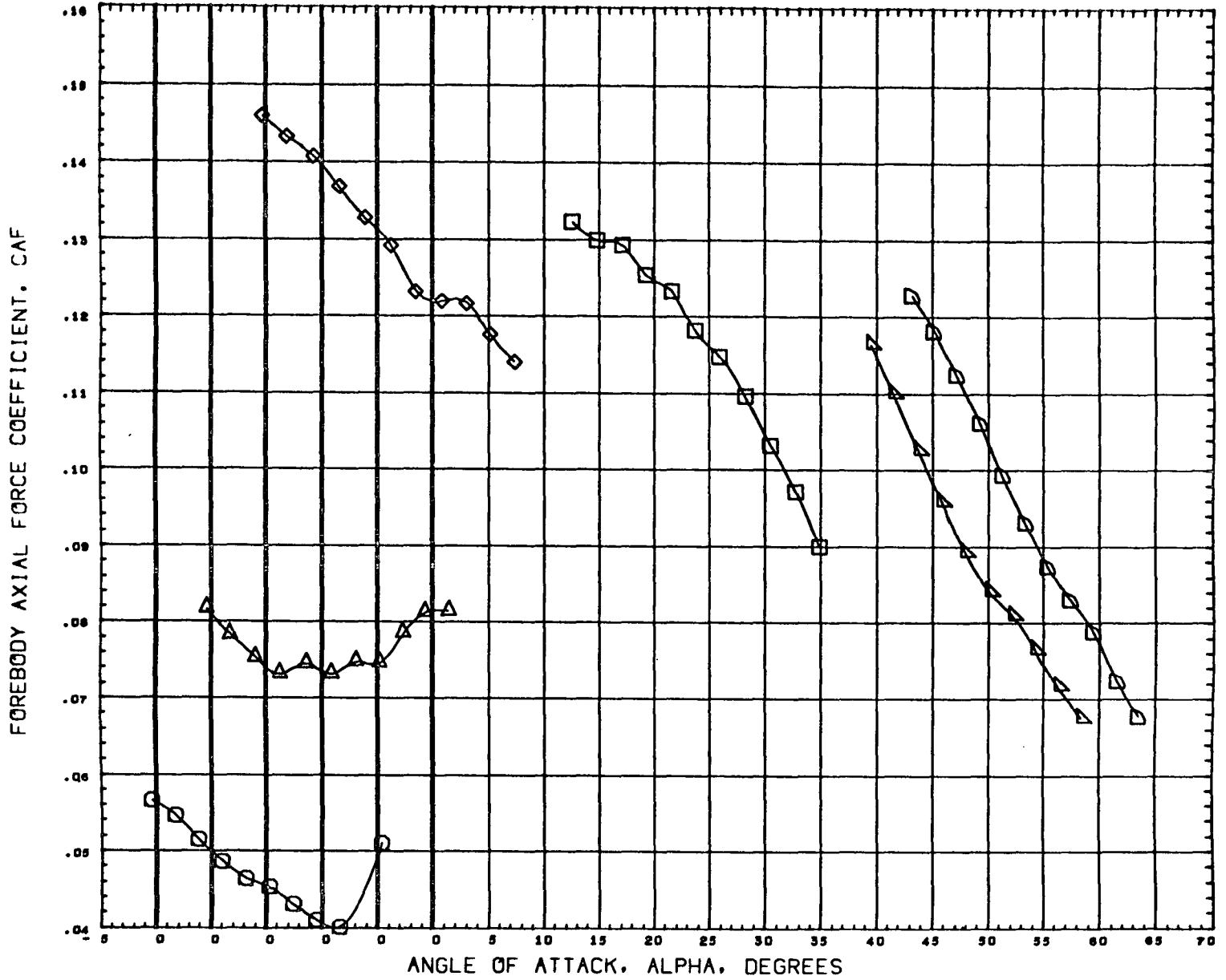


ANGLE OF ATTACK, ALPHA, DEGREES

SYMBOL MACH PARAMETRIC VALUES
 0.596 BETA 0.000 RUDDER 0.000
 0.905 RUDFLR 30.000
 1.197
 1.959
 3.479
 4.959 DATA HIST. CODE *66C*6

REFERENCE INFORMATION
 SREF 14.6836 88. IN.
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 BREF 5.6550 IN.
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 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

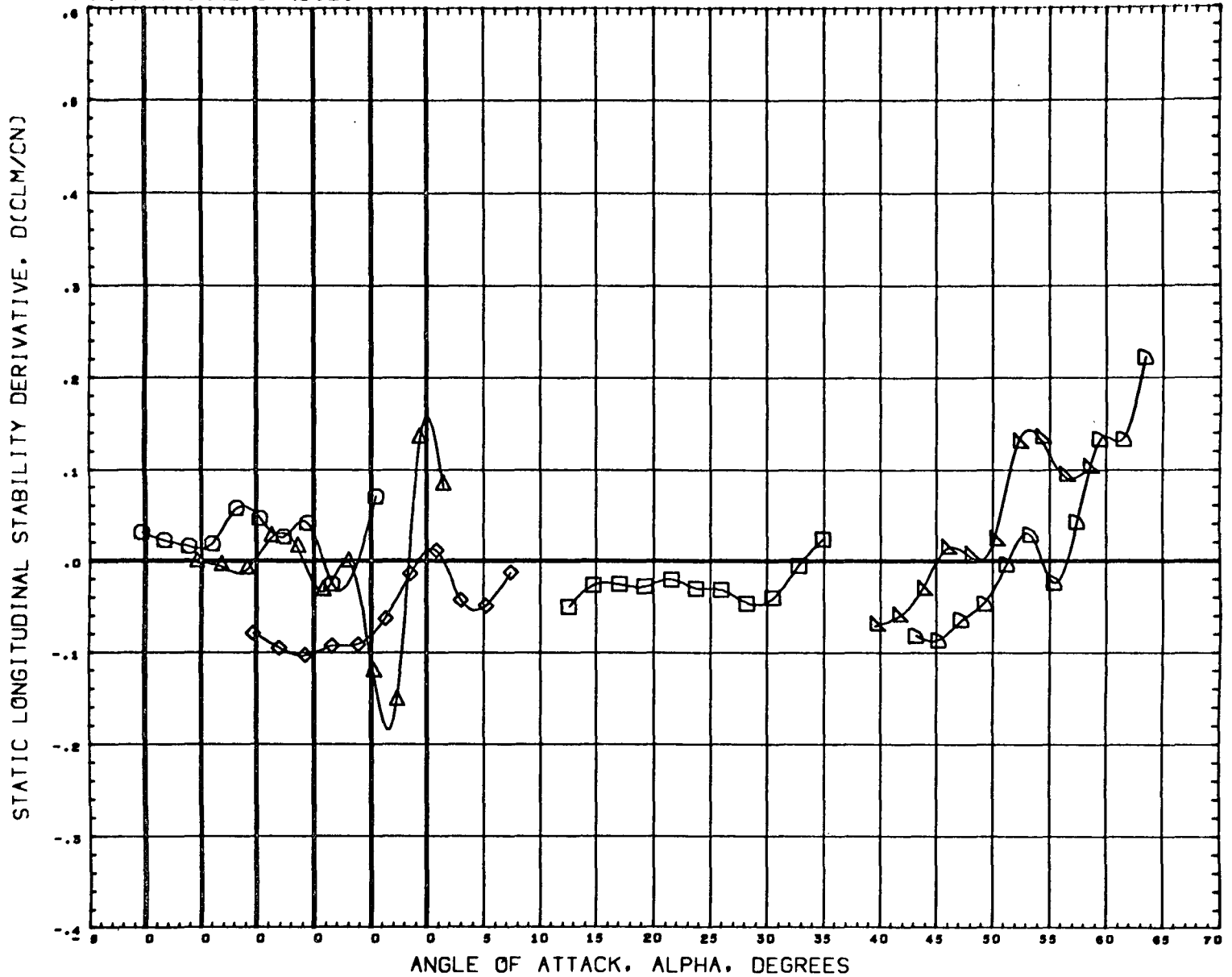
LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
◇	0.998	BETA	0.000	RUDDER
□	0.905	RUDFLR	30.000	0.000
△	1.197			
▽	1.959			
○	3.479			
	4.959	DATA HIST. CODE	#GCC#G	

REFERENCE INFORMATION		
SREF	14.6836	89. IN.
LREF	4.5080	IN.
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YMRP	0.0000	IN.
ZMRP	0.0000	IN.
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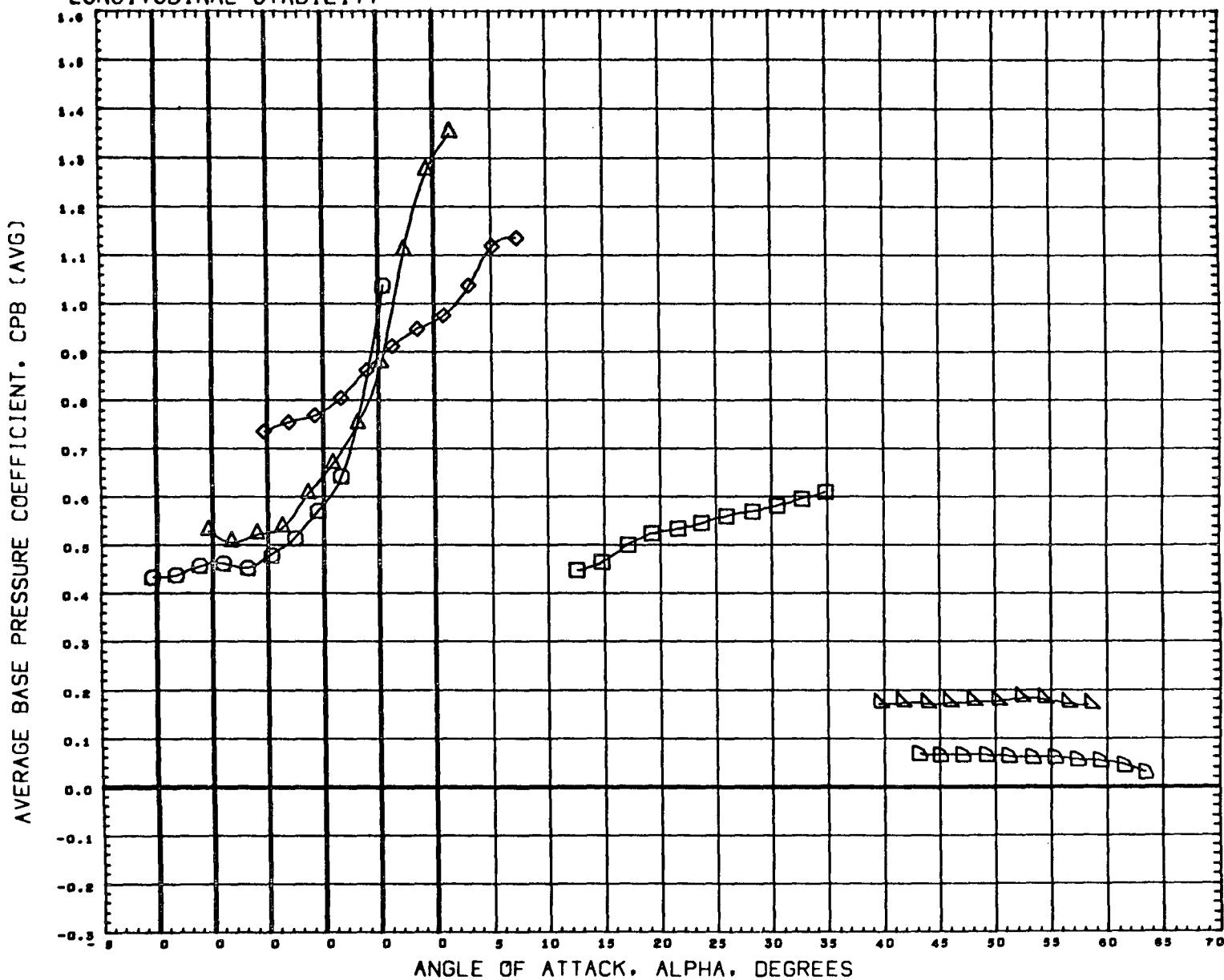
LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
○	0.598	BETA	0.000	RUDDER 0.000
△	0.905	RUDFLR	30.000	
◇	1.197			
◻	1.959			
	3.479			
	4.959	DATA HIST. CODE	#GCC#G	

REFERENCE INFORMATION		
SREF	14.6636	88. IN.
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BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

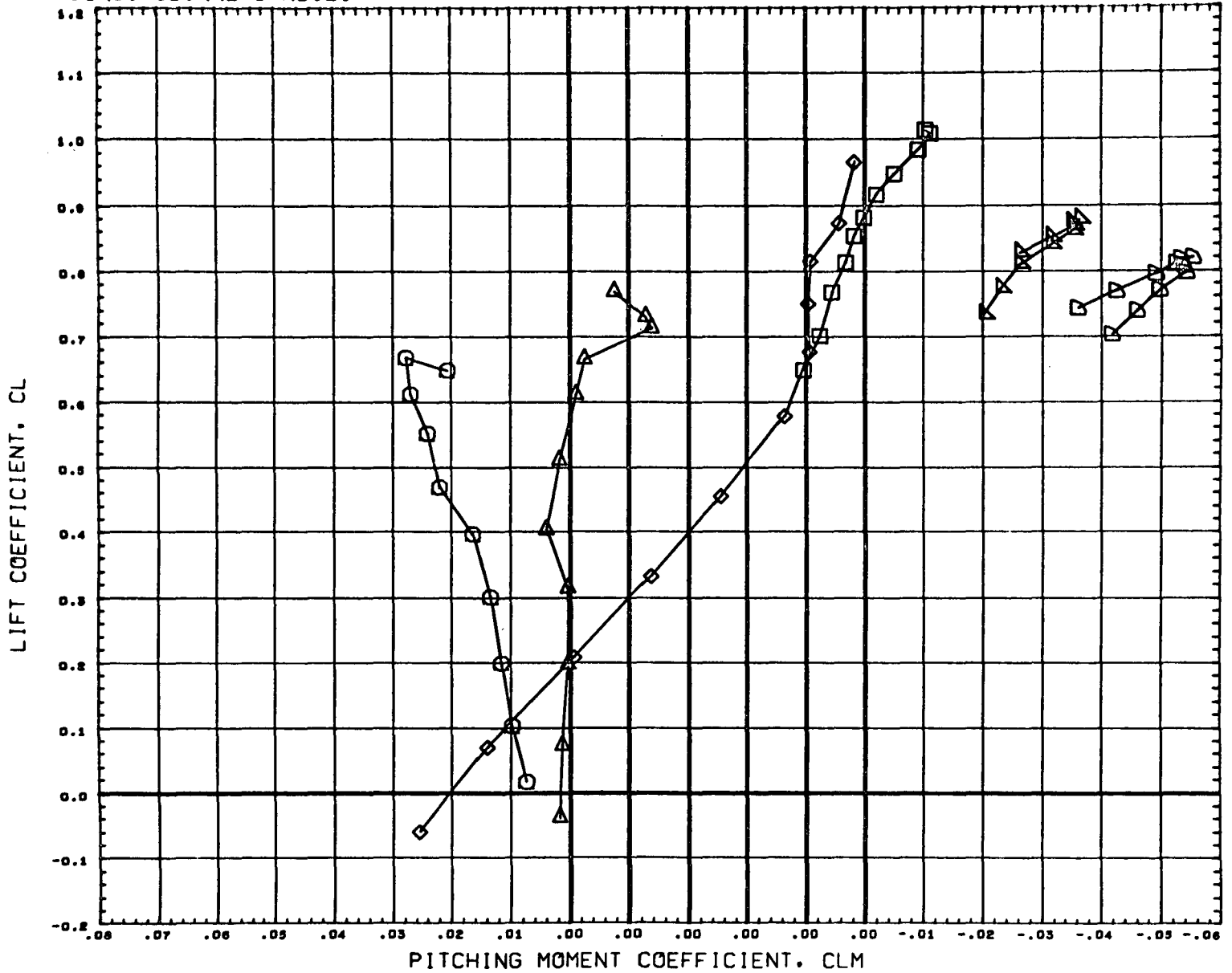
LONGITUDINAL STABILITY



SYMBOL ◇ □ △ ○ ×	MACH	PARAMETRIC VALUES			
	0.598	BETA	0.000	RUDDER	0.000
	0.903	RUDDFLR	30.000		
	1.197				
	1.959				
	3.479				
	4.959	DATA HIST. CODE	#666#6		

REFERENCE INFORMATION		
SREF	14.6836	59. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

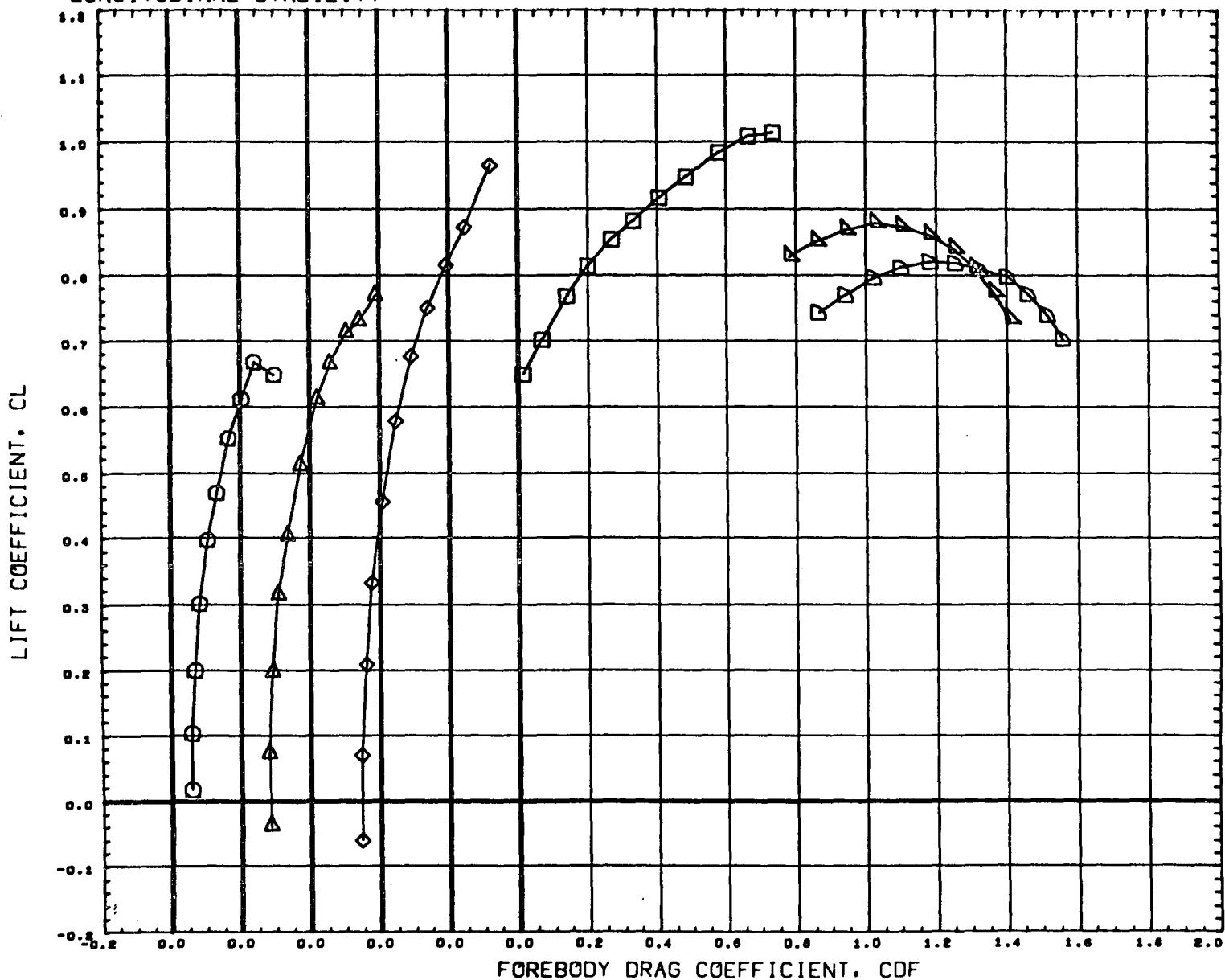
LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
○	0.998	BETA	0.000	RUDDER
◇	0.905	RUDDFLR	30.000	0.000
△	1.197			
□	1.959			
▽	3.479			
◇	4.959	DATA HIST. CODE	*GGC*G	

REFERENCE INFORMATION		
SREF	14.6036	80 IN.
LREF	4.5060	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

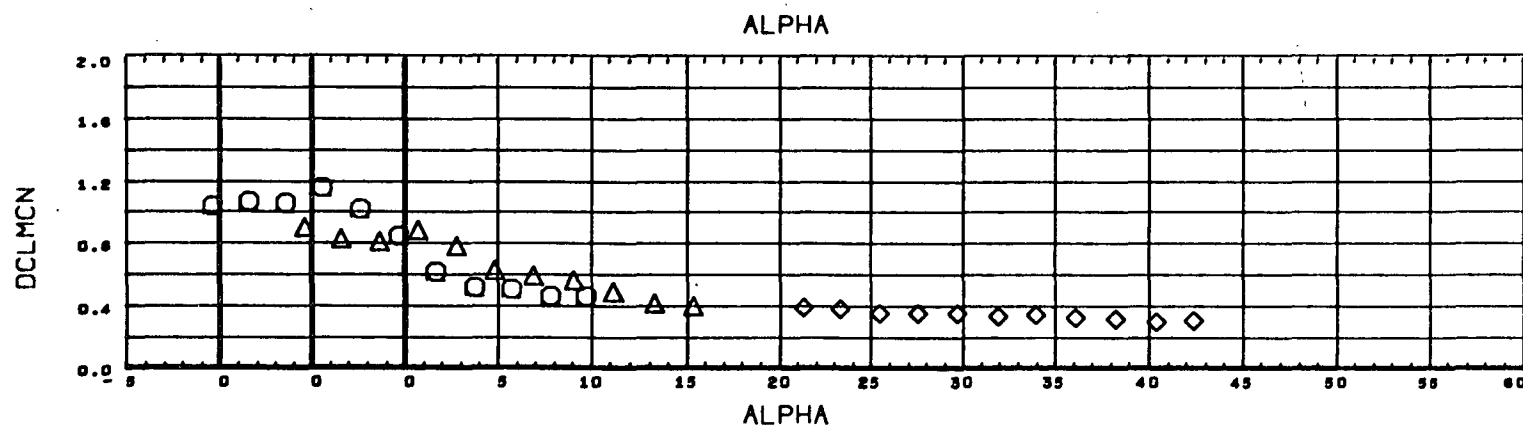
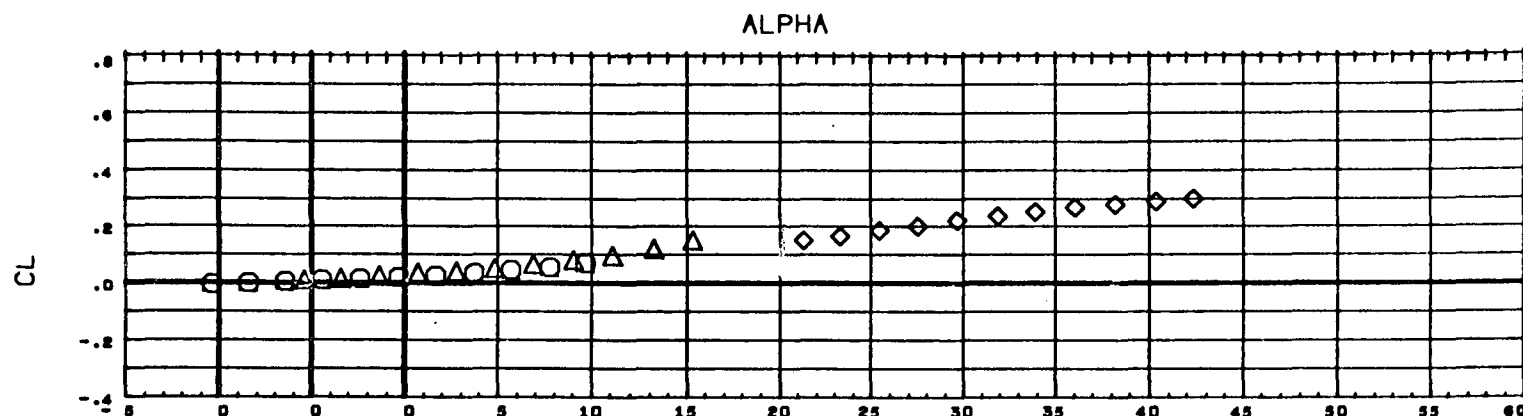
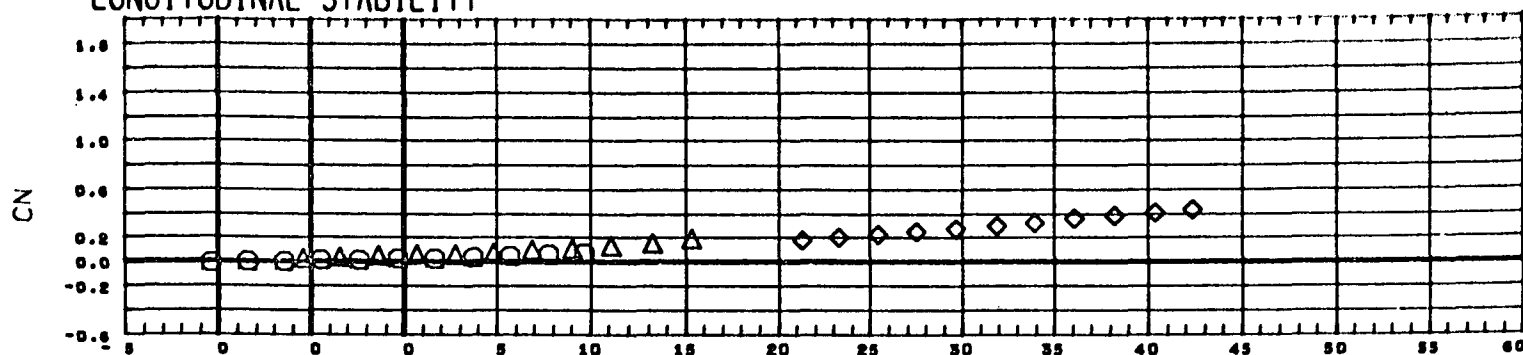
LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
○	0.598	BETA	0.000	RUDDER 0.000
△	0.905	RUDFLR	30.000	
◇	1.197			
□	1.959			
◇	3.479			
◇	4.959	DATA MIST. CODE	#GGC*6	

REFERENCE INFORMATION		
SREF	14.6636	89. IN.
LREF	4.5080	IN.
BREF	9.6550	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.996	0.000	
△	1.196	0.000	
◇	1.961	0.000	

REFERENCE INFORMATION		
SREF	14.6836	80. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE *66C

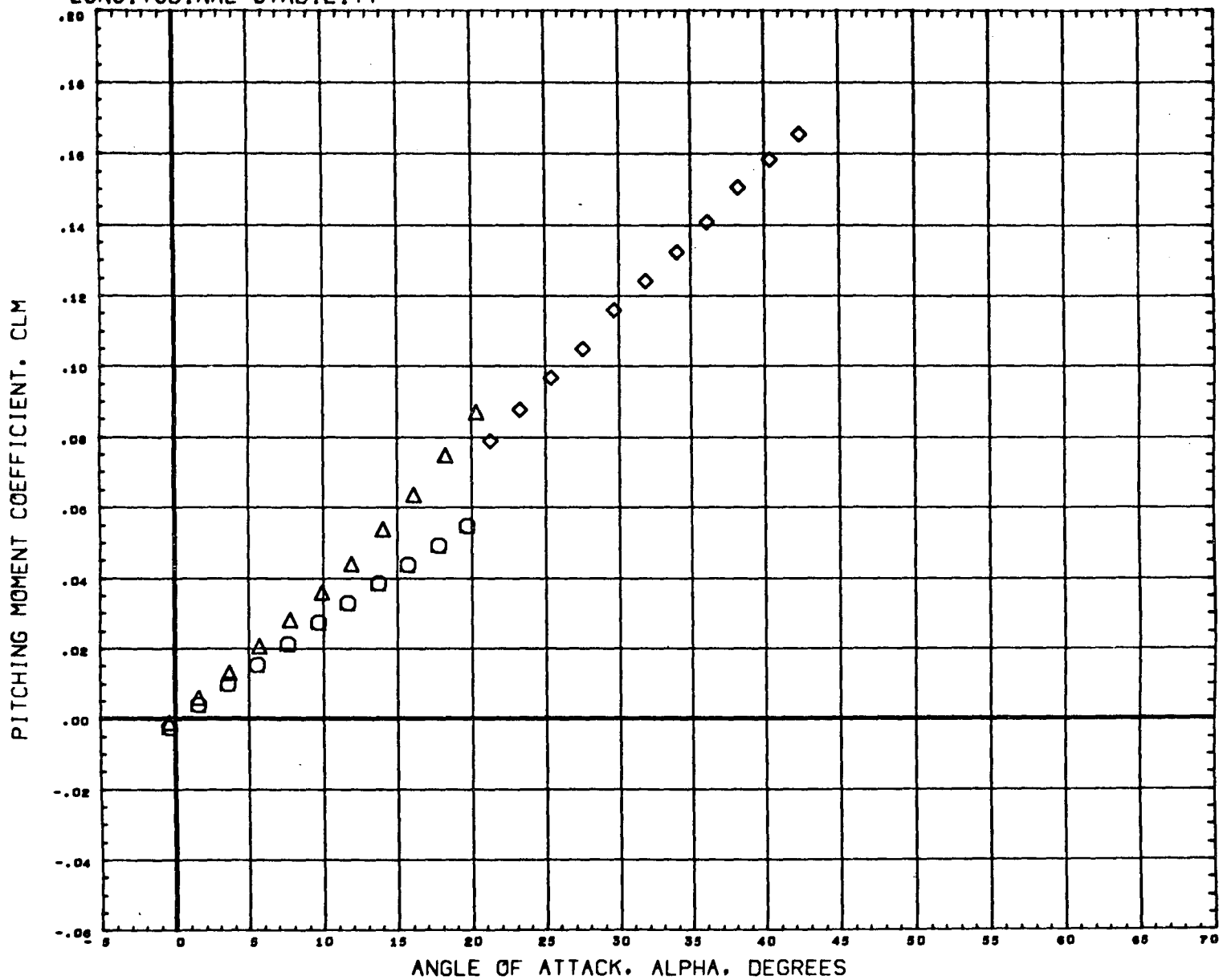
M513-MSFC MODELAR1216I-2

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LONGITUDINAL STABILITY



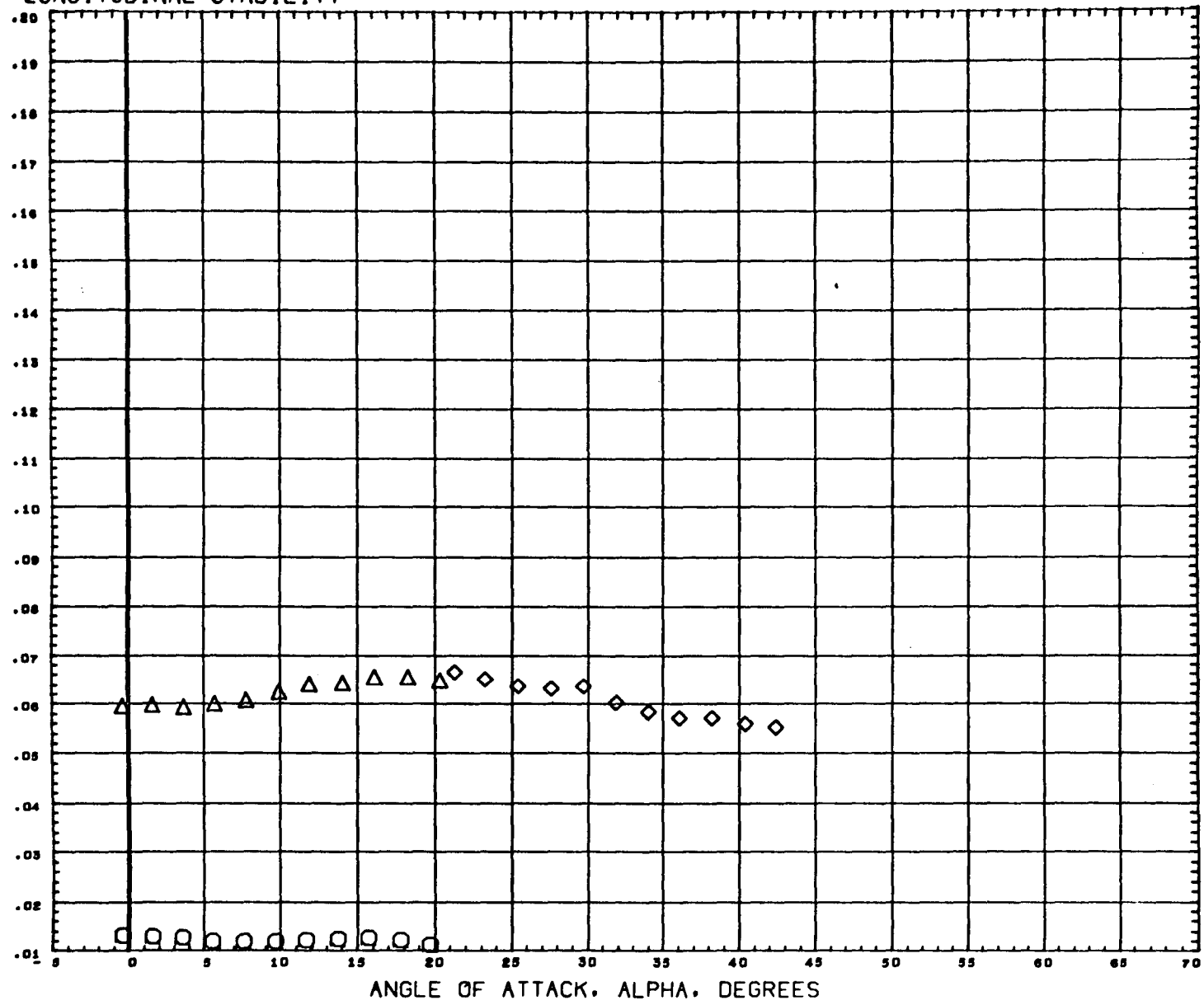
SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.996		0.000
△	1.196		
◇	1.961		

REFERENCE INFORMATION		
SREF	14.6636	80. IN.
LREF	4.5060	IN.
SREF	5.6350	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE *66C

AXIAL FORCE CORRECTED TO FREE STREAM PRESSURE AT THE BASE REGION. CAT

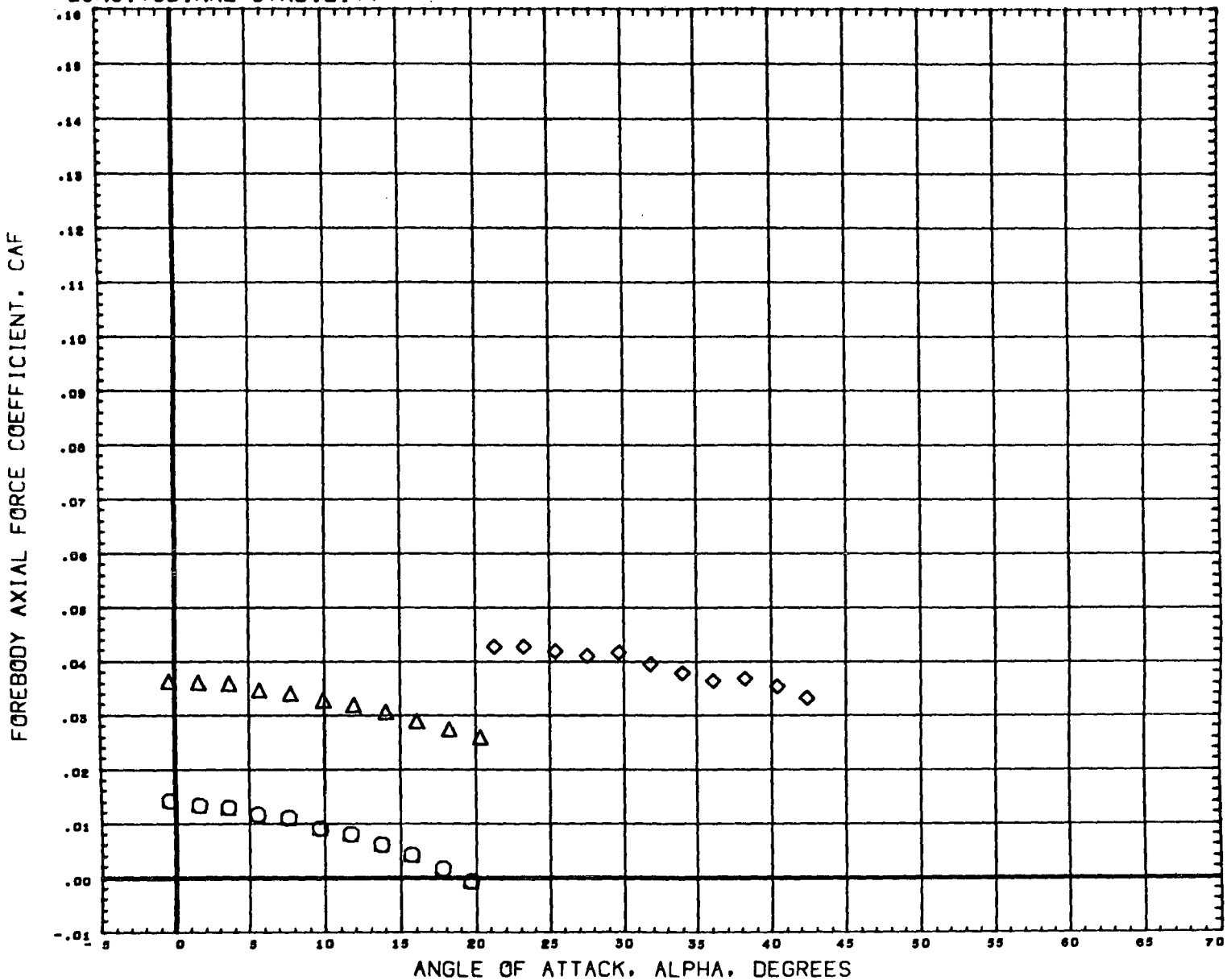
LONGITUDINAL STABILITY



PARAMETRIC VALUES		REFERENCE INFORMATION	
MACH	BETA	SREF	86. IN.
0.596	0.000	LREF	IN.
1.196		BREF	IN.
1.961		XMRP	IN.
		YMRP	IN.
		ZMRP	IN.
		SCALE	0.0034

DATA HIST. CODE *66C

LONGITUDINAL STABILITY



SYMBOL MACH BETA PARAMETRIC VALUES
 □ 0.996 0.000
 □ 1.196
 ◇ 1.961

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE *66C

M513-MSFC MODELAR12161-2

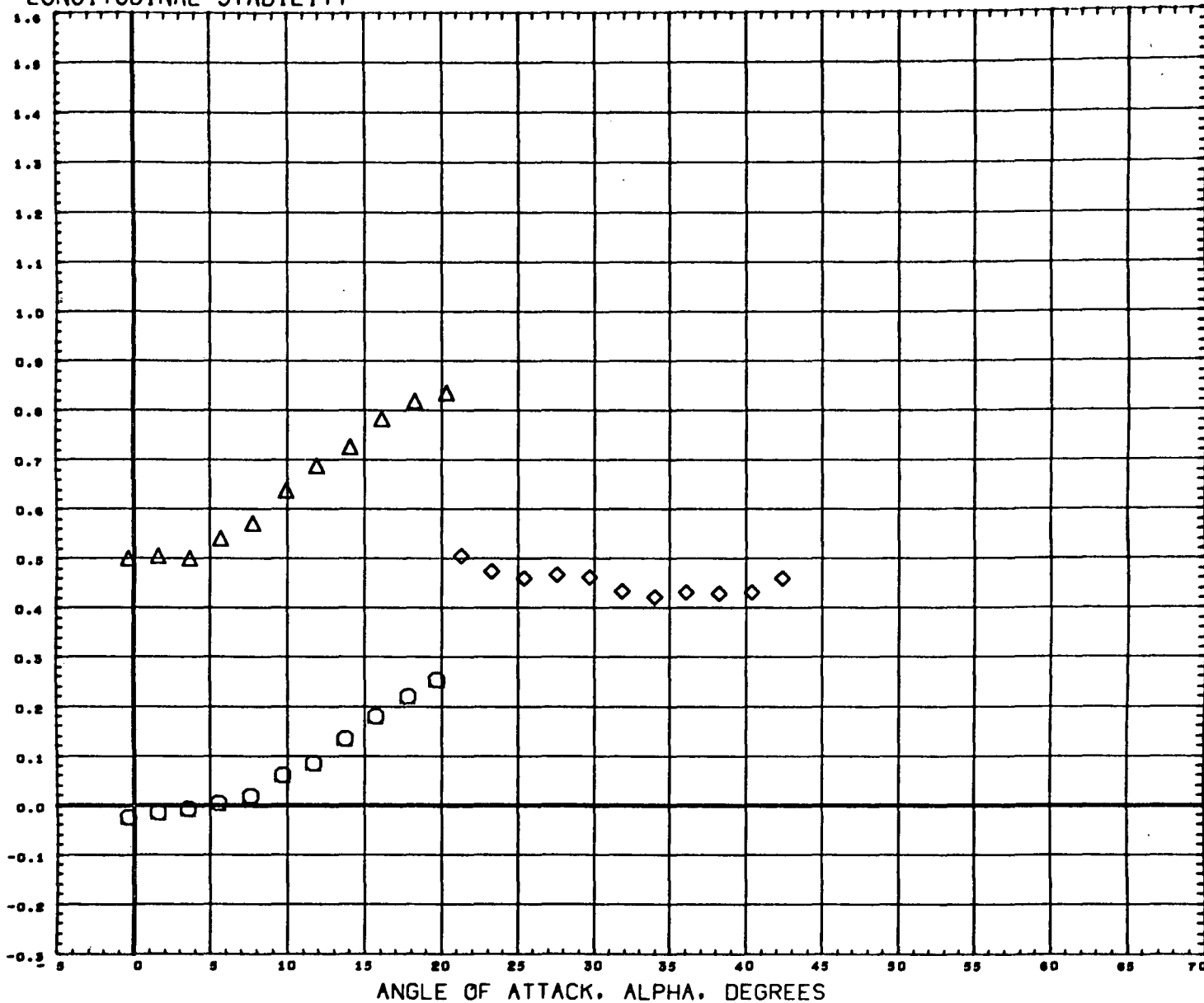
B5CS1

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LONGITUDINAL STABILITY

AVERAGE BASE PRESSURE COEFFICIENT, CPB (AVG)



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.596		0.000
△	1.196		
◇	1.961		

REFERENCE INFORMATION		
SREF	14.6836	80. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE *66C

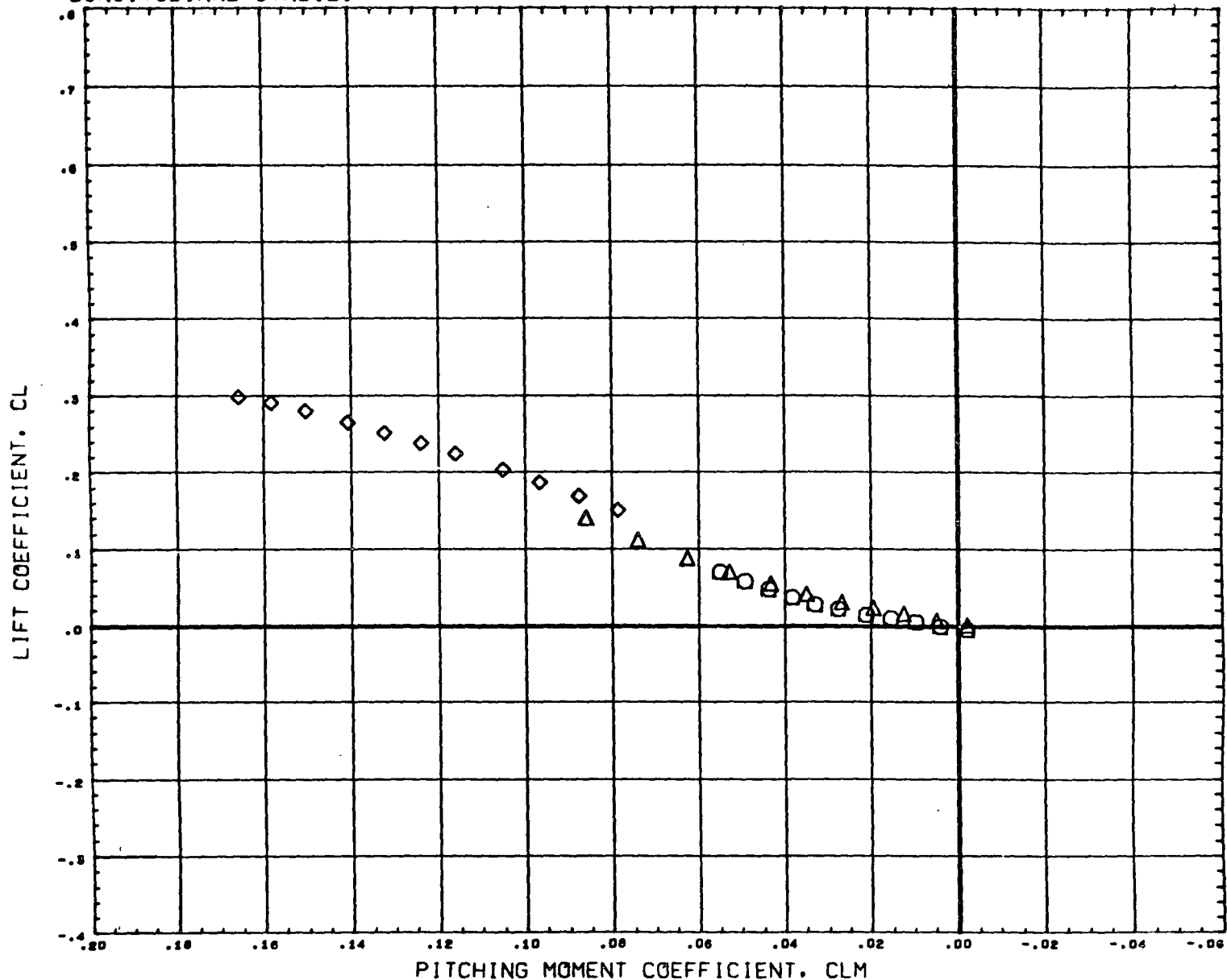
M513-MSFC MODELAR1216I-2

B5CS1

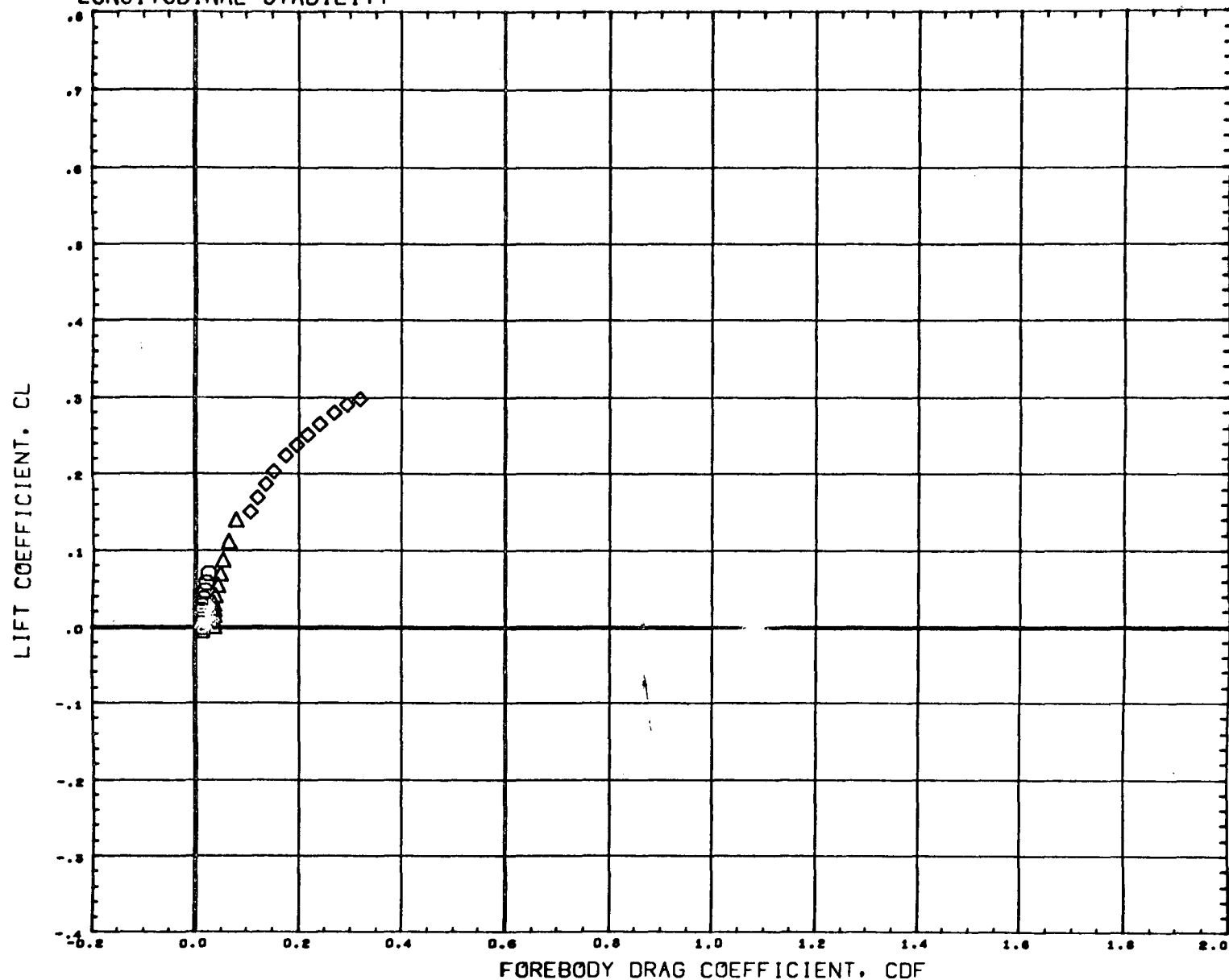
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LONGITUDINAL STABILITY



LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.596		0.000
△	1.196		
◇	1.961		

DATA HIST. CODE #66C

REFERENCE INFORMATION		
SREF	14.6636	84. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

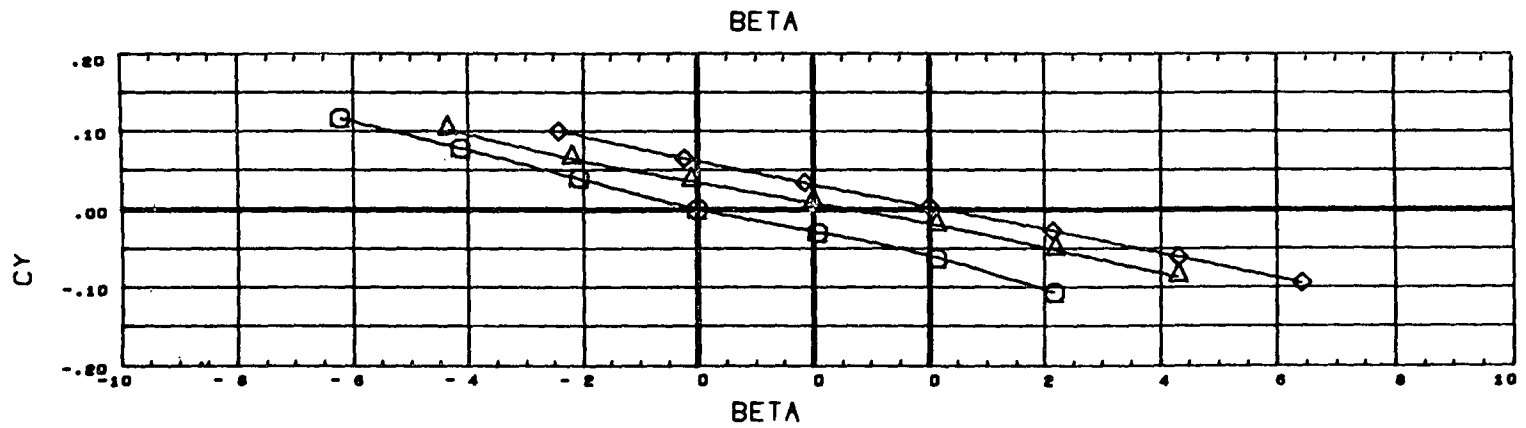
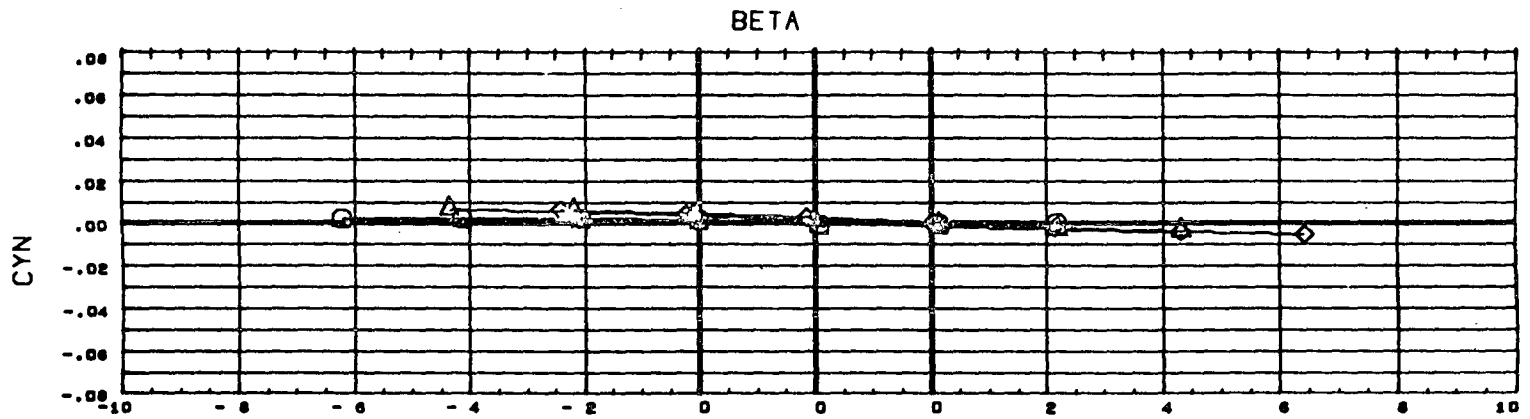
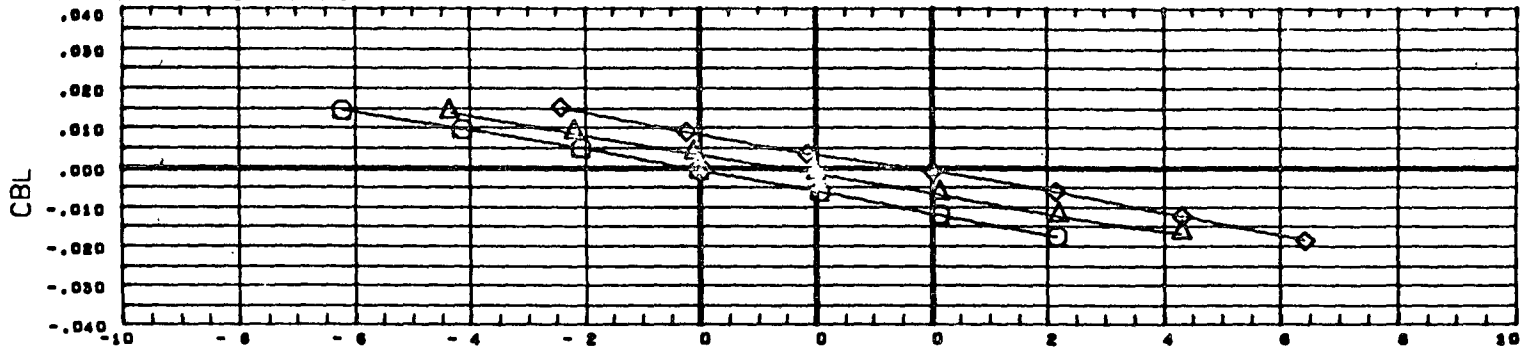
M513-MSFC MODELAR12161-2

B5CS1

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LATERAL STABILITY

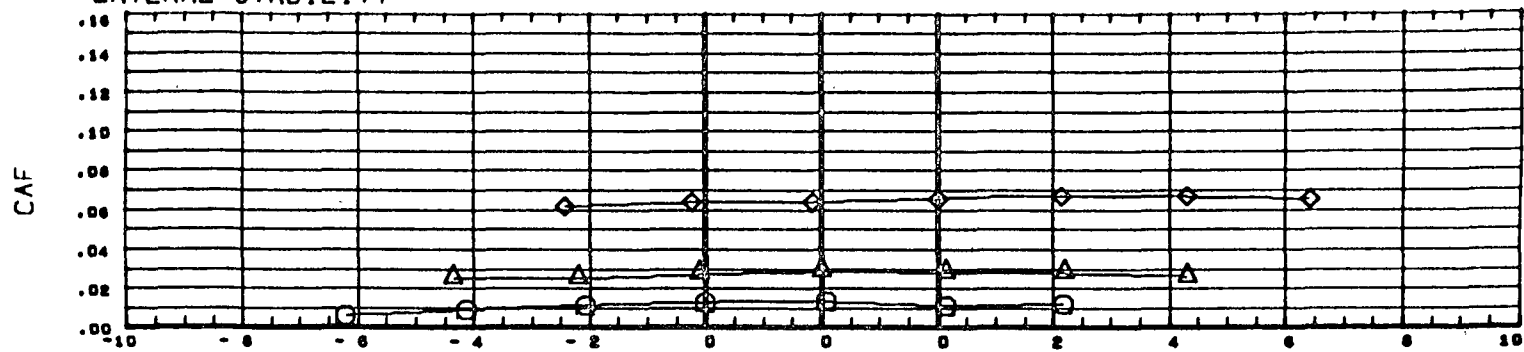


SYMBOL	MACH	PARAMETRIC VALUES		
○	0.598	ALPHA	10.000	RUDDER 0.000
△	0.897	RUDFLR	0.000	
◇	1.196			

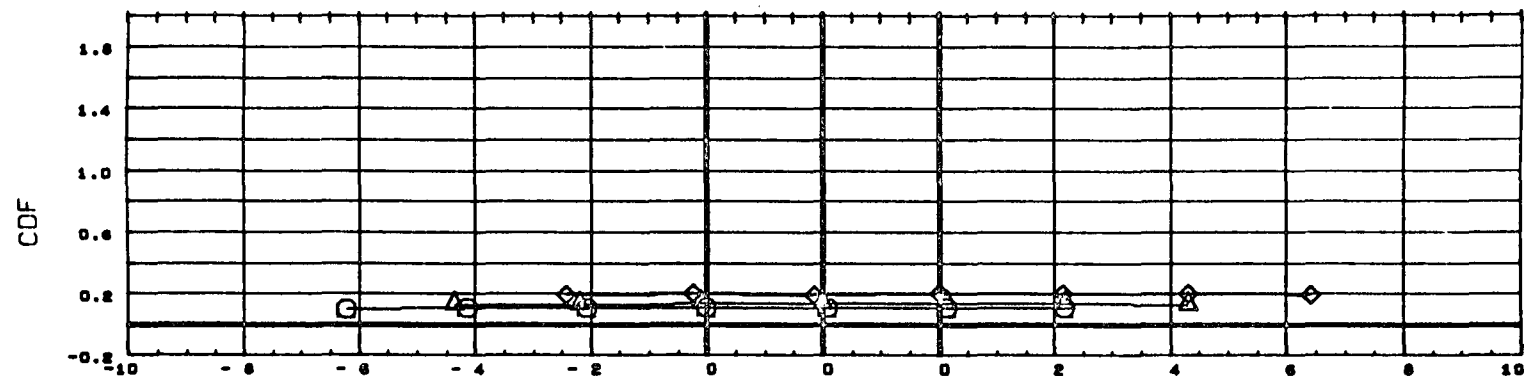
REFERENCE INFORMATION		
SREF	14.6836	88. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

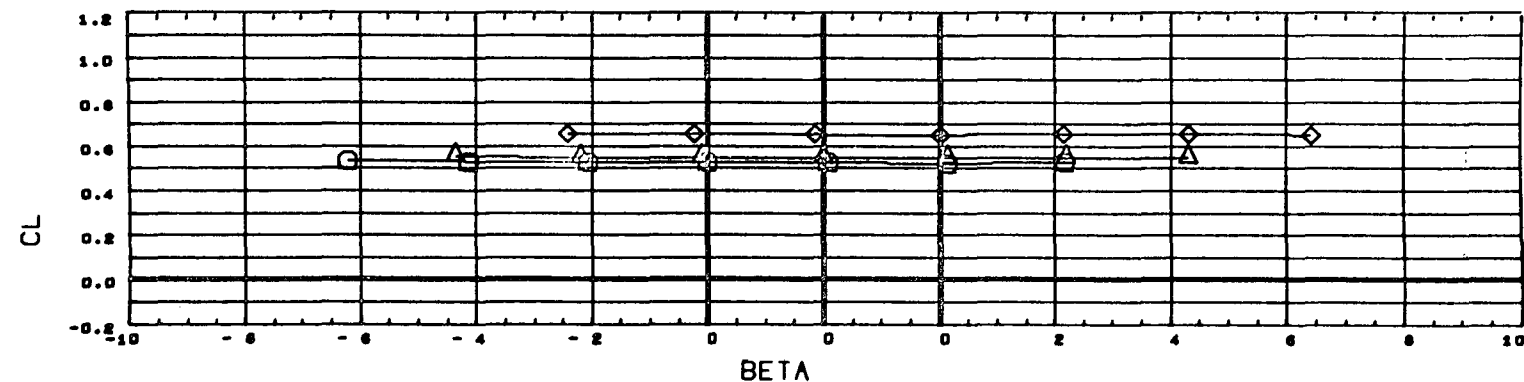
LATERAL STABILITY



BETA



BETA



BETA

SYMBOL	MACH	PARAMETRIC VALUES		
○	0.998	ALPHA	10.000	RUDDER 0.000
△	0.997	RUDFLR	0.000	
◇	1.196			

REFERENCE INFORMATION		
SREF	14.6836	80. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

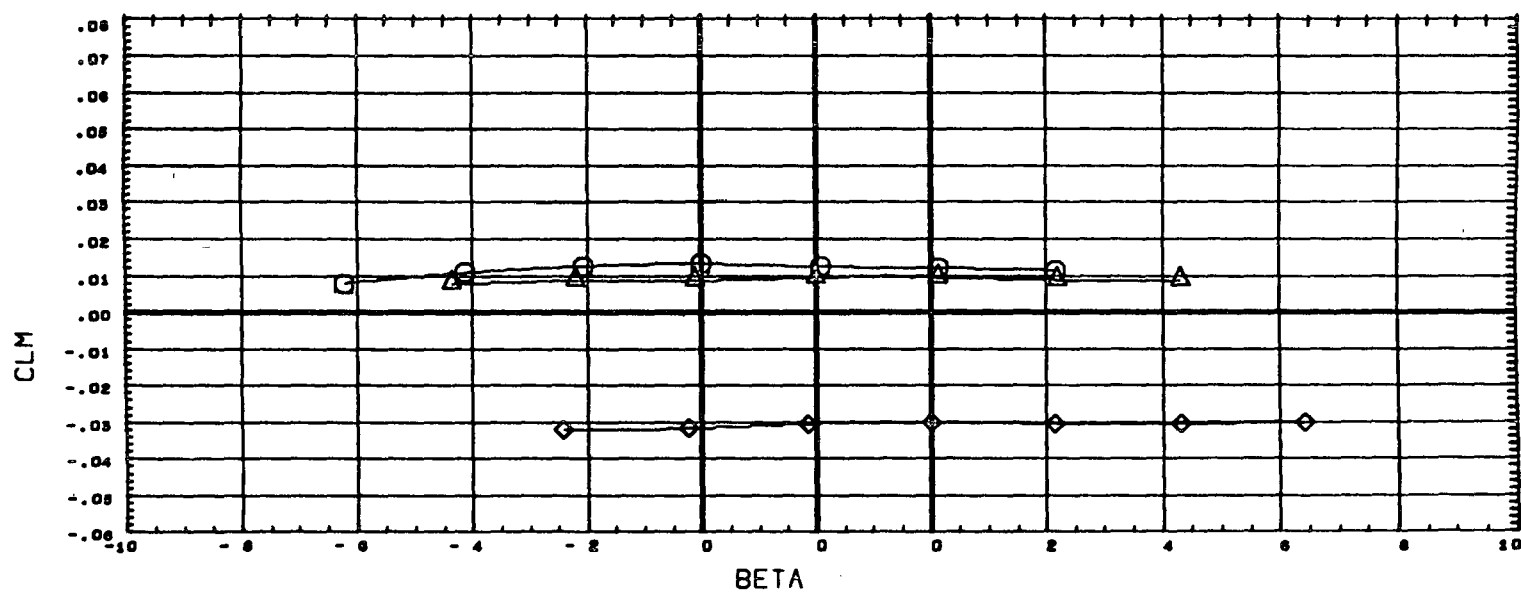
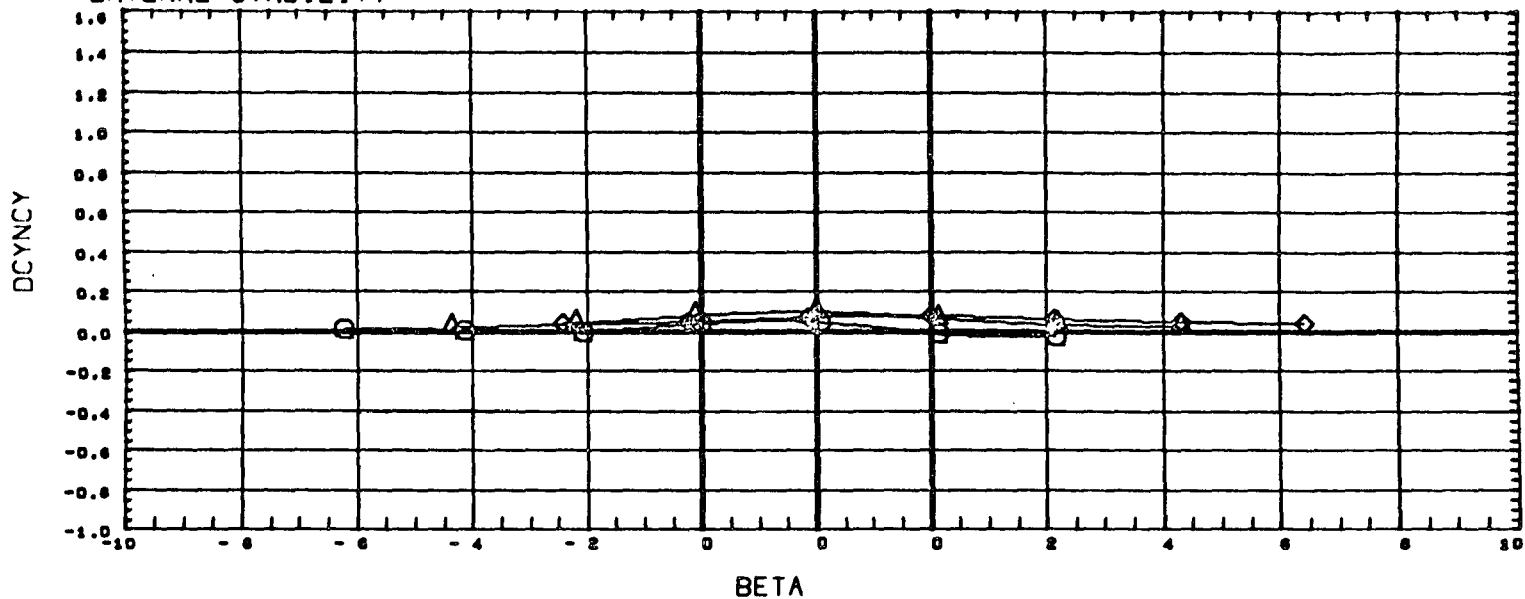
M513-MSFC MODELAR12161-2

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LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
	0.598	ALPHA	10.000	RUDDER 0.000
	0.897	RUDFLR	0.000	
◇	1.198			

REFERENCE INFORMATION		
SREF	14.6836	88. IN.
LREF	4.5080	IN.
BREF	9.6550	IN.
XHRP	1.4821	IN.
YHRP	0.0000	IN.
ZHRP	0.0000	IN.
SCALE	0.0034	

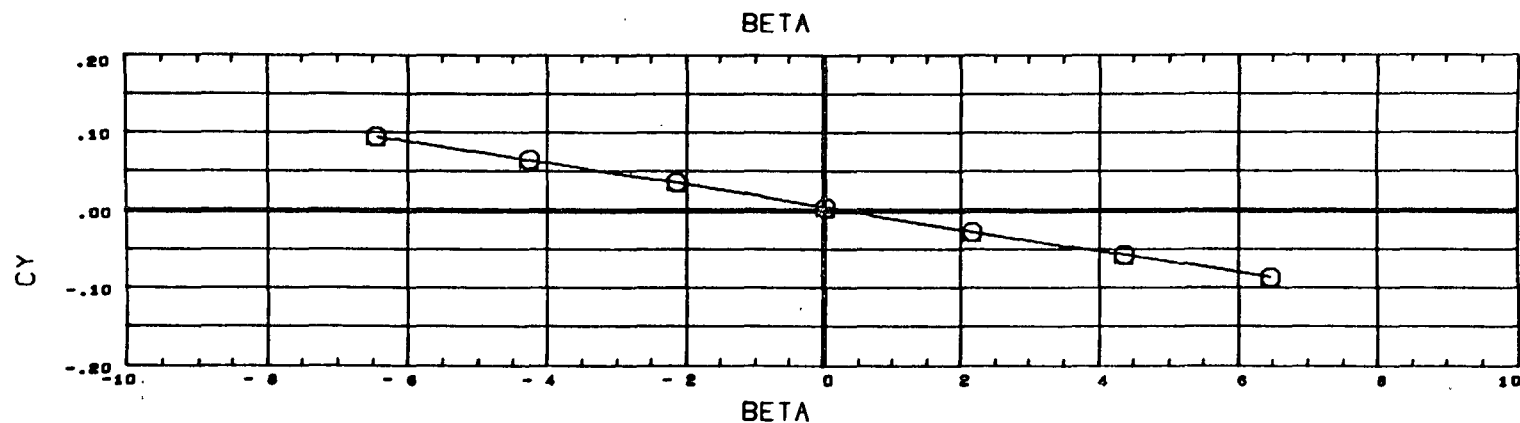
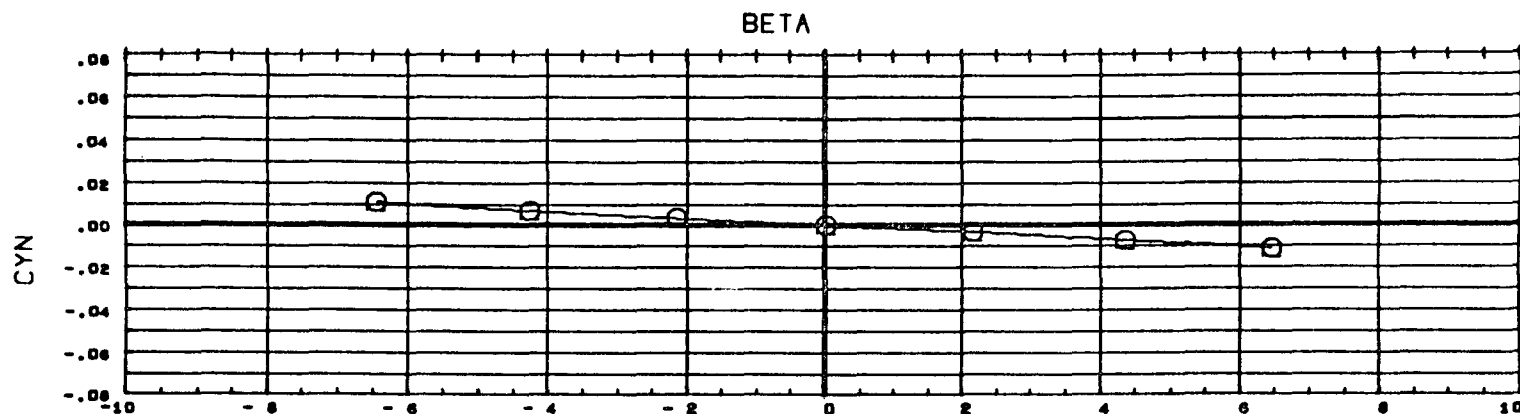
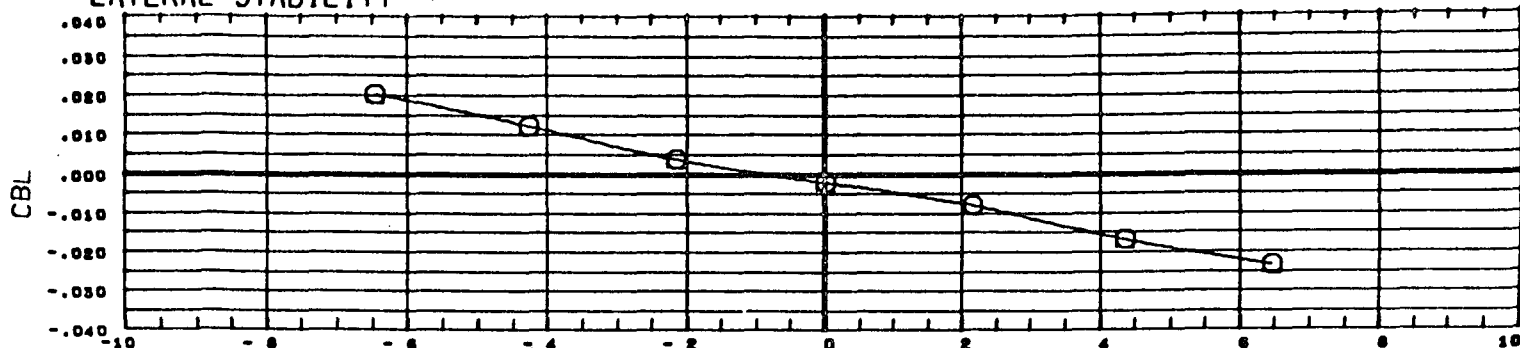
DATA HIST. CODE GC

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SYMBOL \square MACH 1.199 ALPHA 15.000 RUDDER 0.000
 RUDFLR 0.000

REFERENCE INFORMATION
 SREF 14.6836 39. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XHRP 1.4821 IN.
 YHRP 0.0000 IN.
 ZHRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

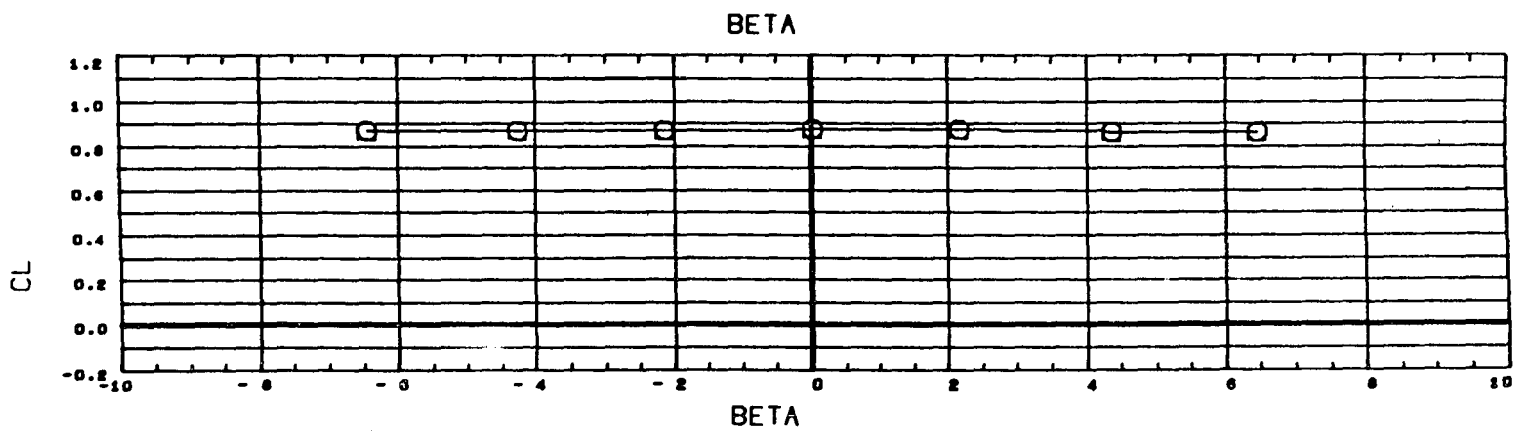
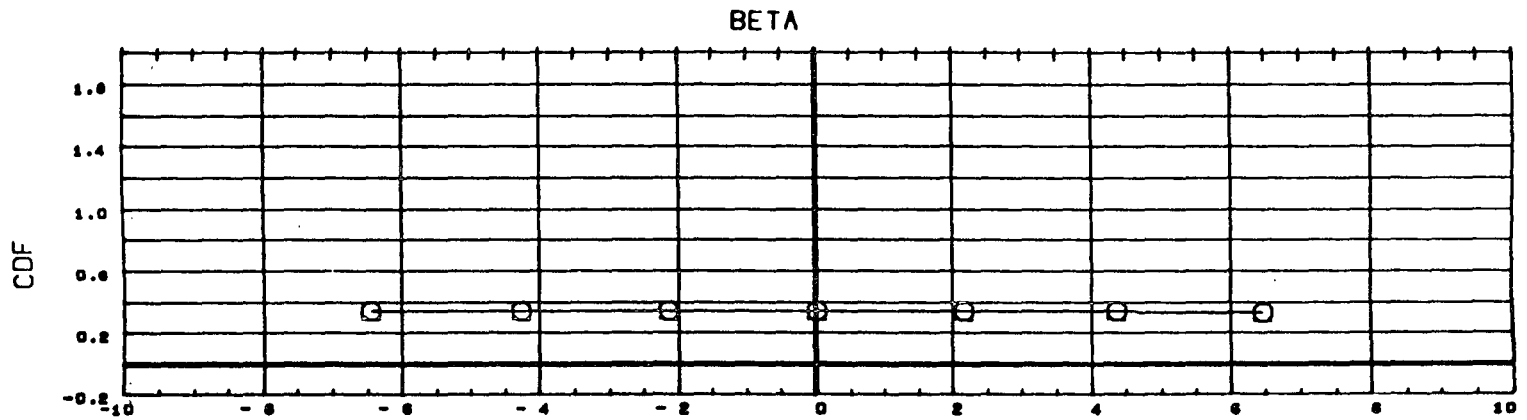
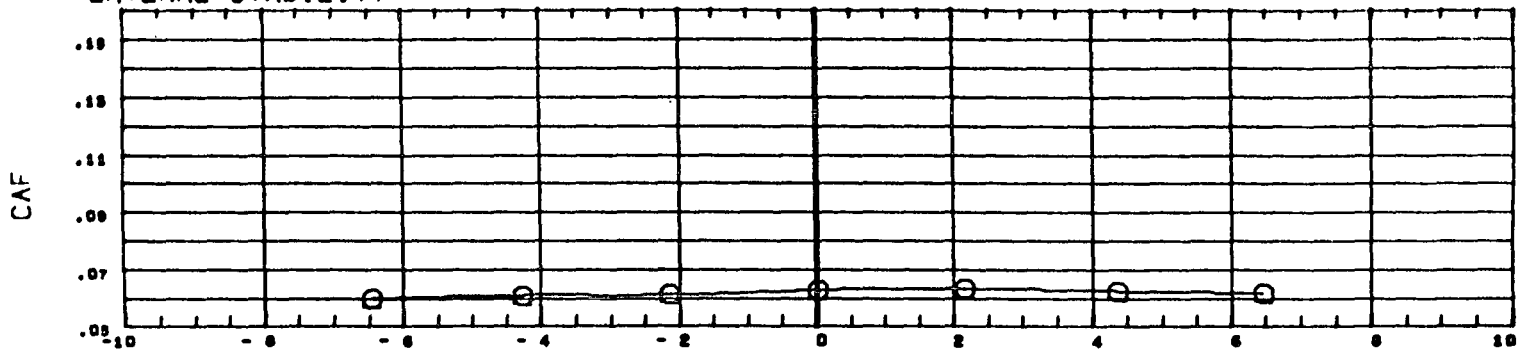
M513-MSFC MODELAR12161-2

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LATERAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 O 1.199 ALPHA 19.000 RUDDER 0.000
 RUDDLR 0.000

REFERENCE INFORMATION
 SREF 14.6836 59. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

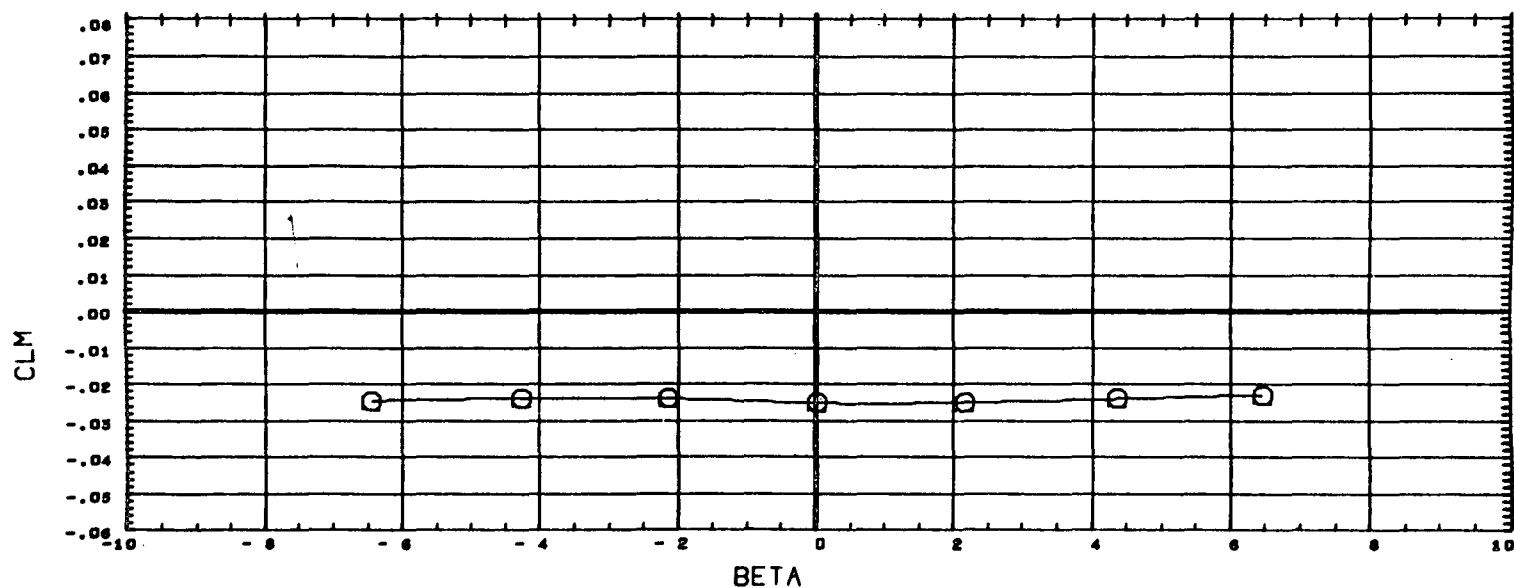
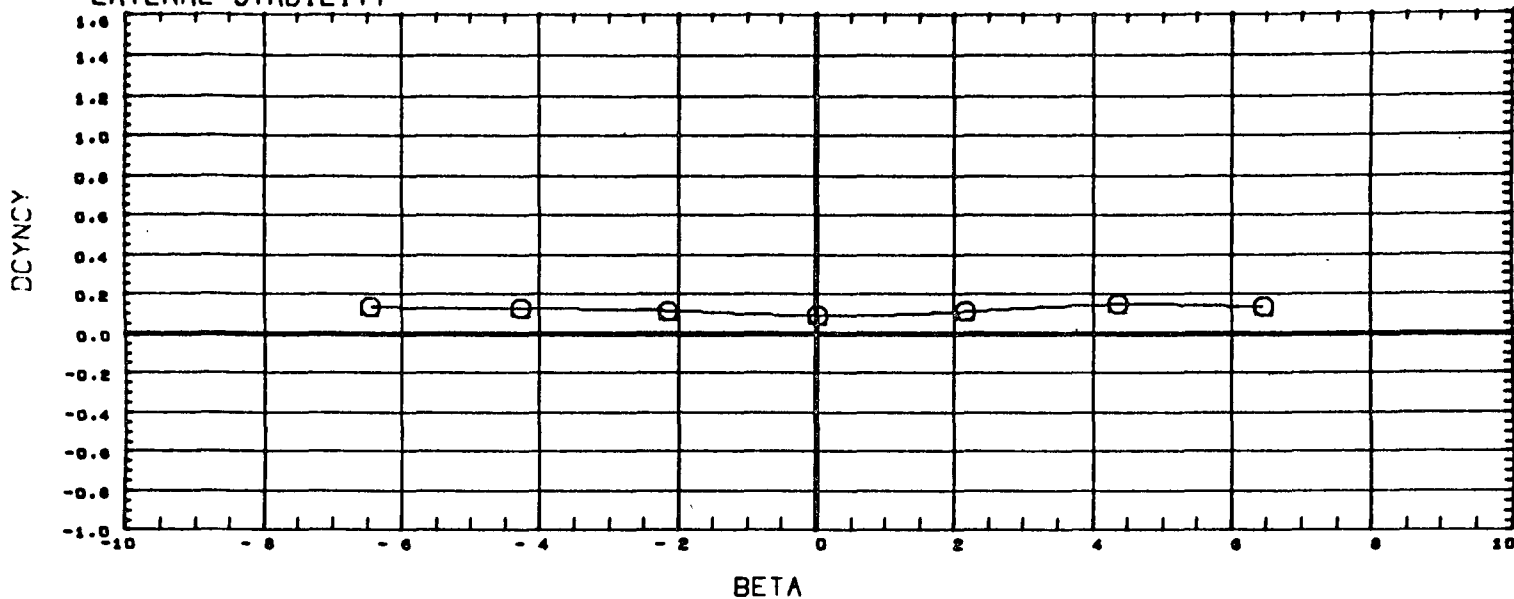
M513-MSFC MODELAR1216I-2

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LATERAL STABILITY



SYMBOL \square MACH 1.199
 PARAMETRIC VALUES
 ALPHA 15.000 RUDDER 0.000
 RUDFLR 0.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

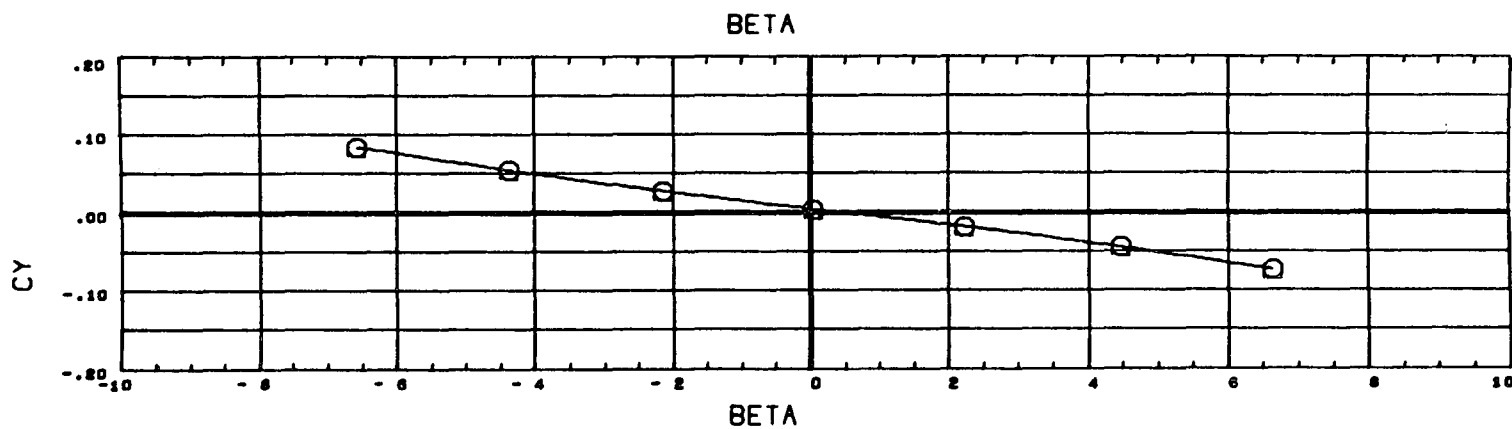
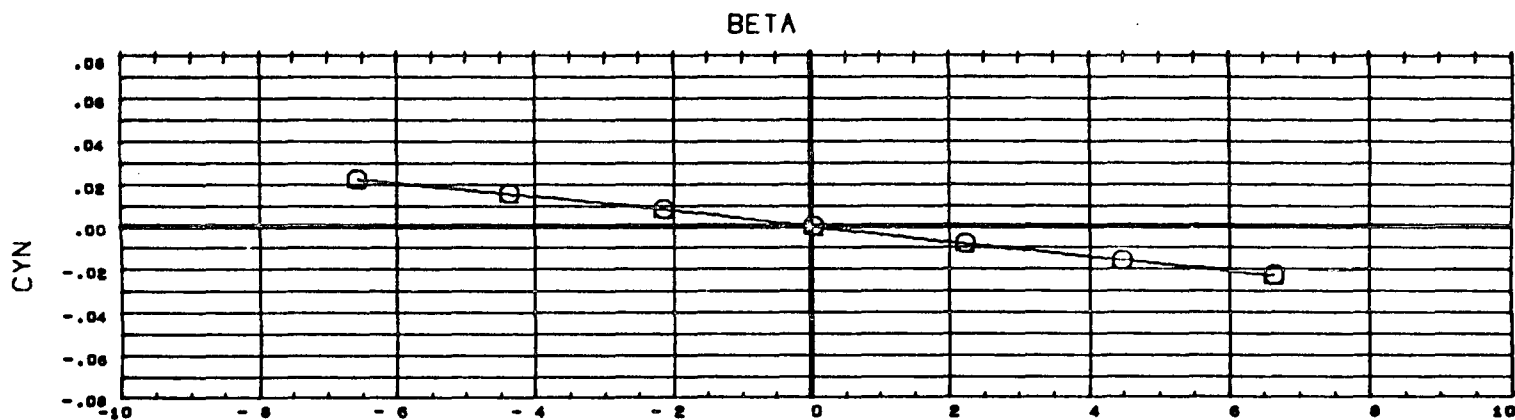
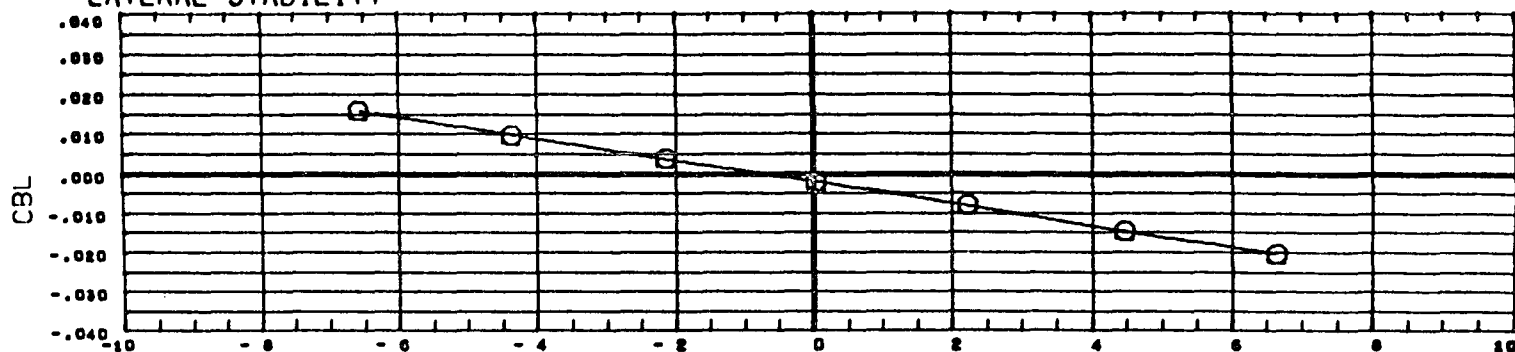
M513-MSFC MODELAR1216I-2

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LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	1.966	ALPHA	25.000	RUDDER	0.000
		RUDFLR	0.000		

REFERENCE INFORMATION		
SREF	14.6636	80. IN.
LREF	4.9060	IN.
BREF	5.6950	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

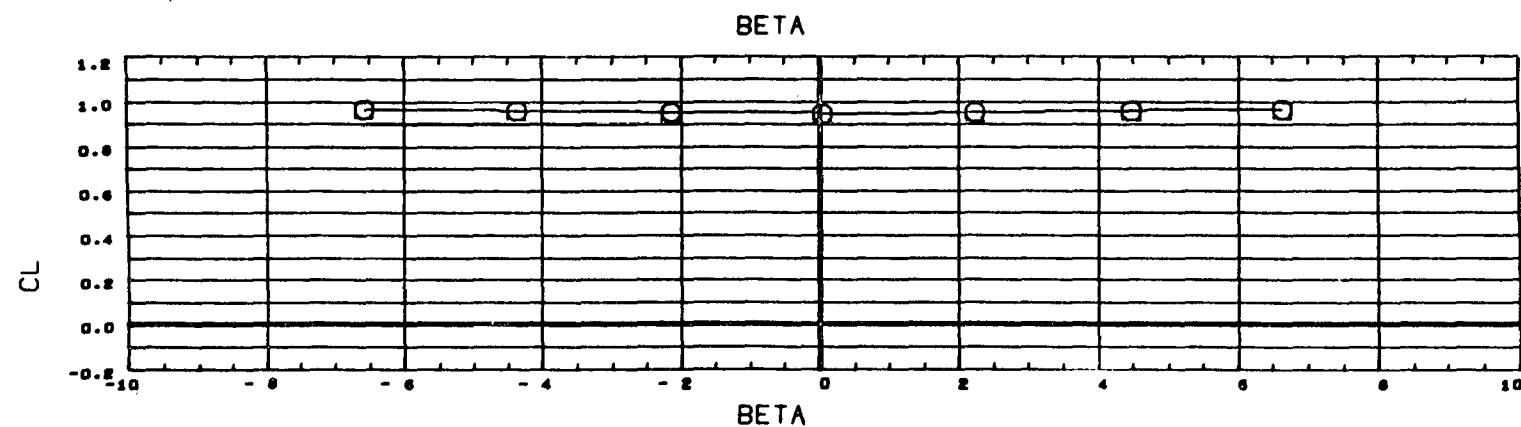
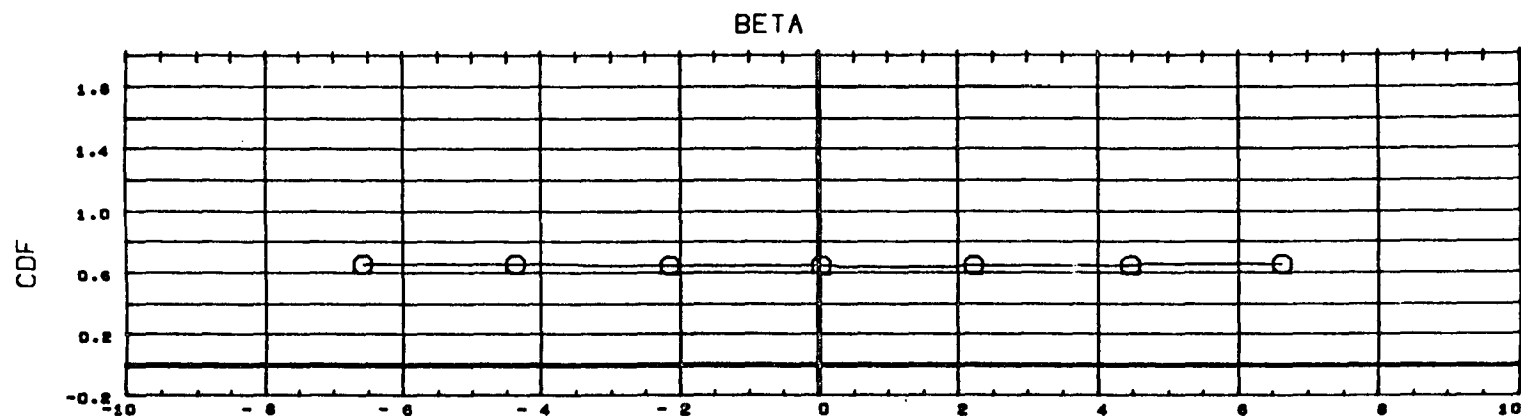
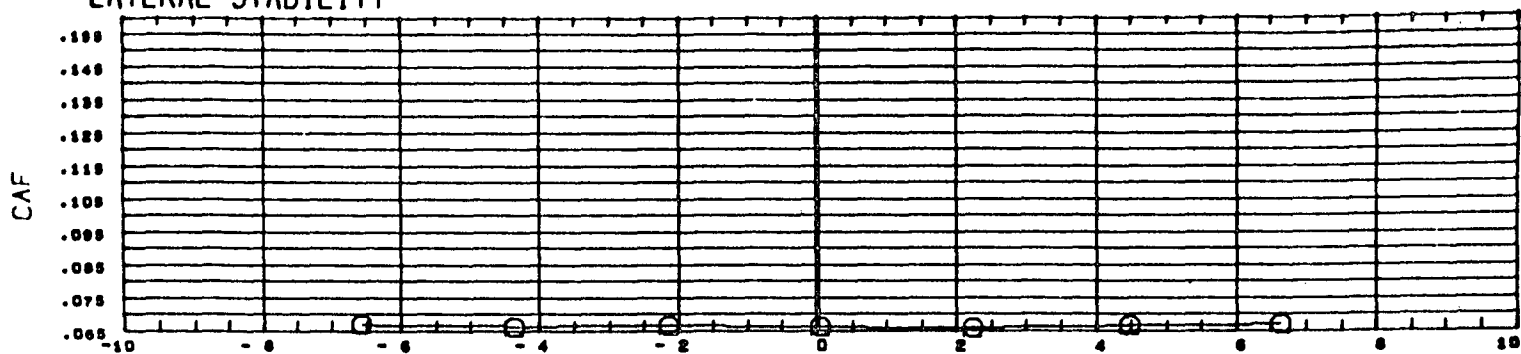
M513-MSFC MODELAR12161-2

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LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	1.966	ALPHA	25.000	RUDDER	0.000
		RUDFLR	0.000		

REFERENCE INFORMATION		
SREF	14.6836	89. IN.
LREF	4.9080	IN.
BREF	5.6350	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

M513-MSFC MODELAR12161-2

B4W11AF2S1V7

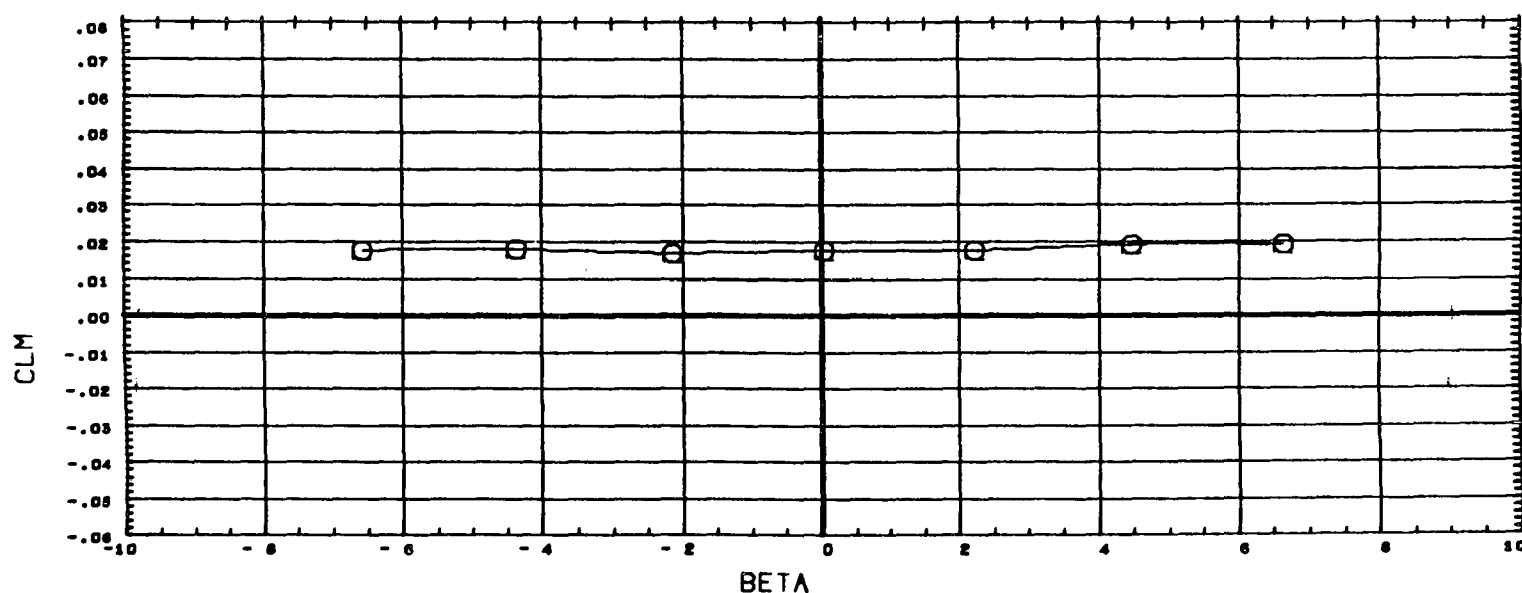
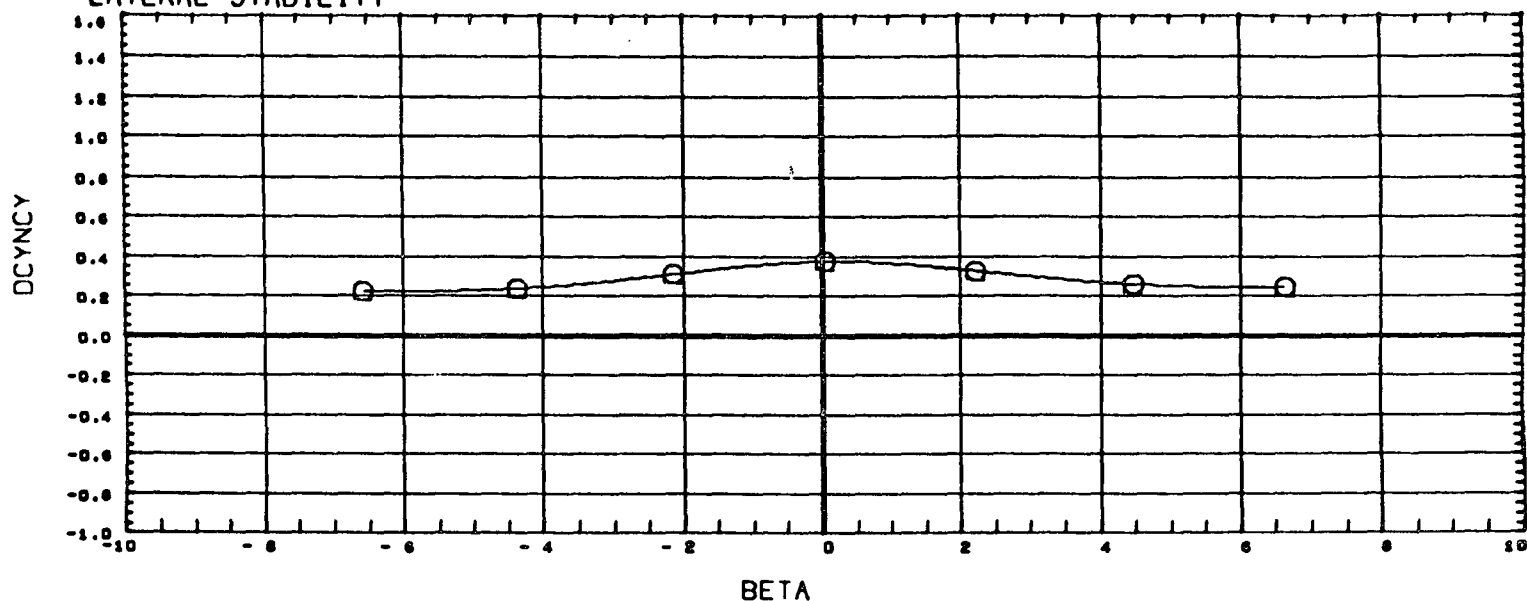
(C5321L)

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LATERAL STABILITY



SYMBOL \bigcirc MACH 1.966
 PARAMETRIC VALUES
 ALPHA 25.000 RUDDER 0.000
 RUDDLER 0.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.5080 IN.
 BREF 9.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

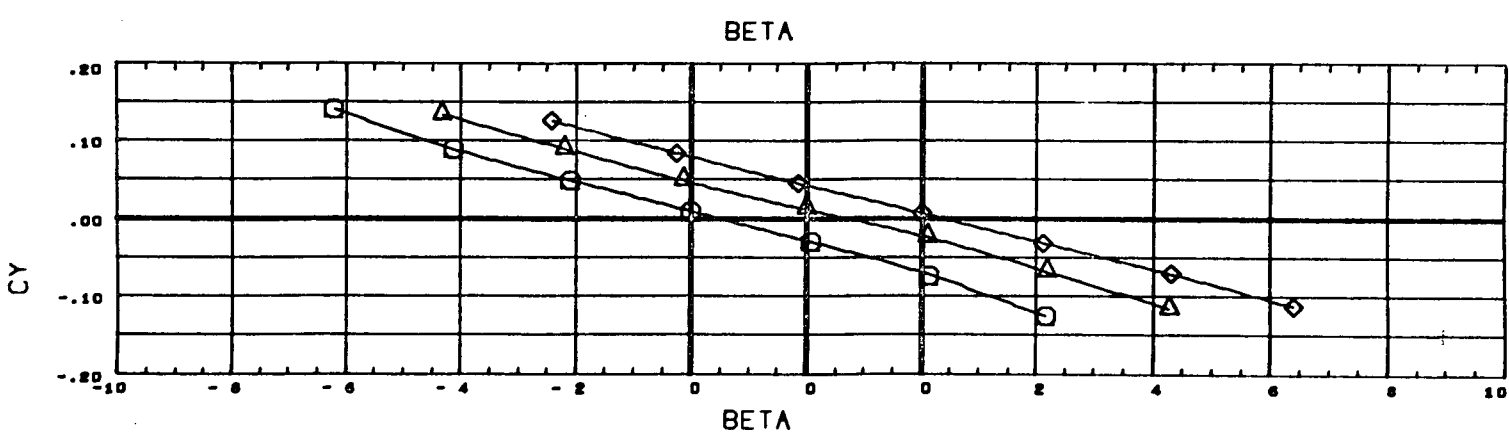
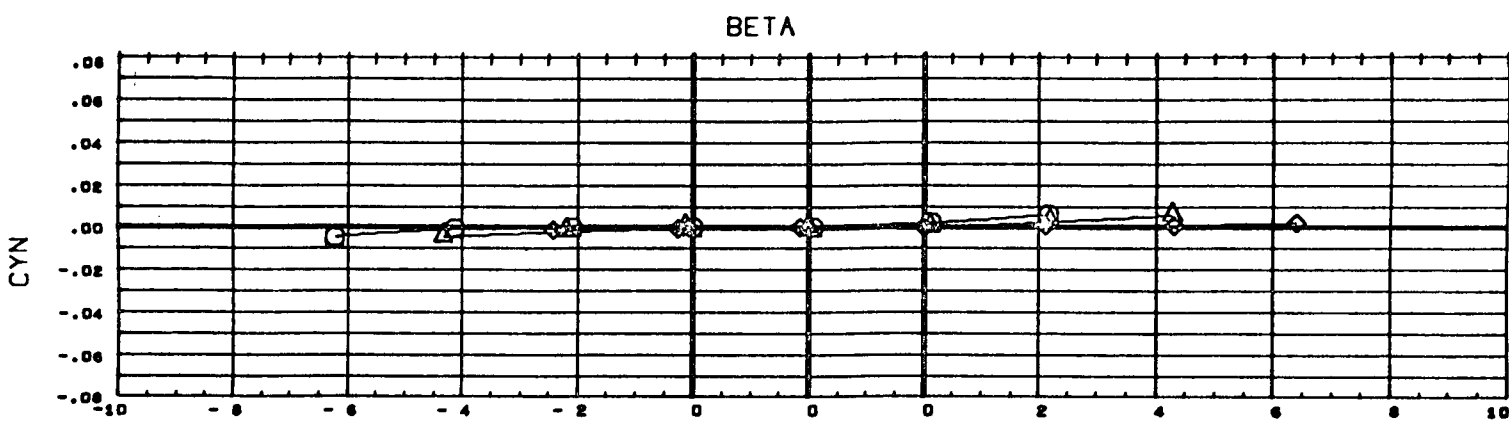
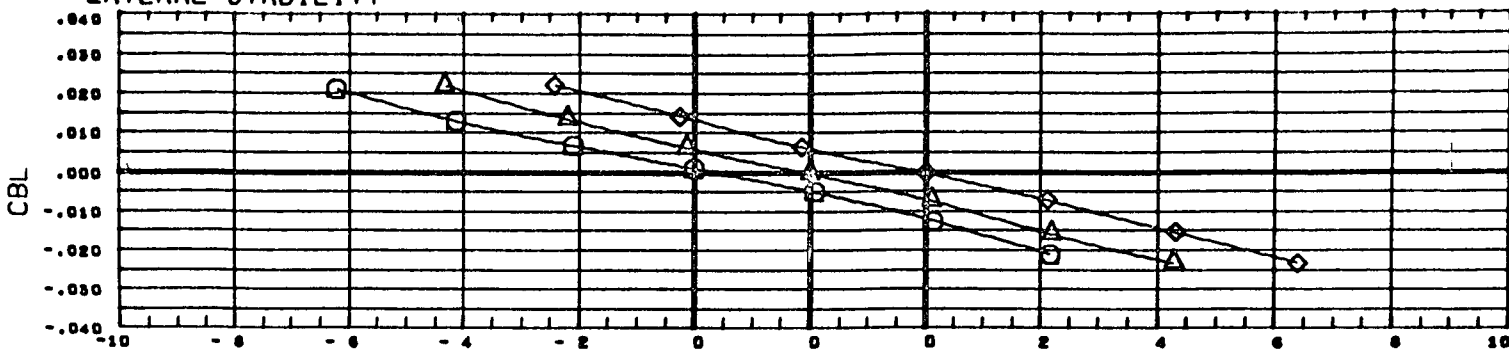
M513-MSFC MODELAR12161-2

B4W11AF2S1V7

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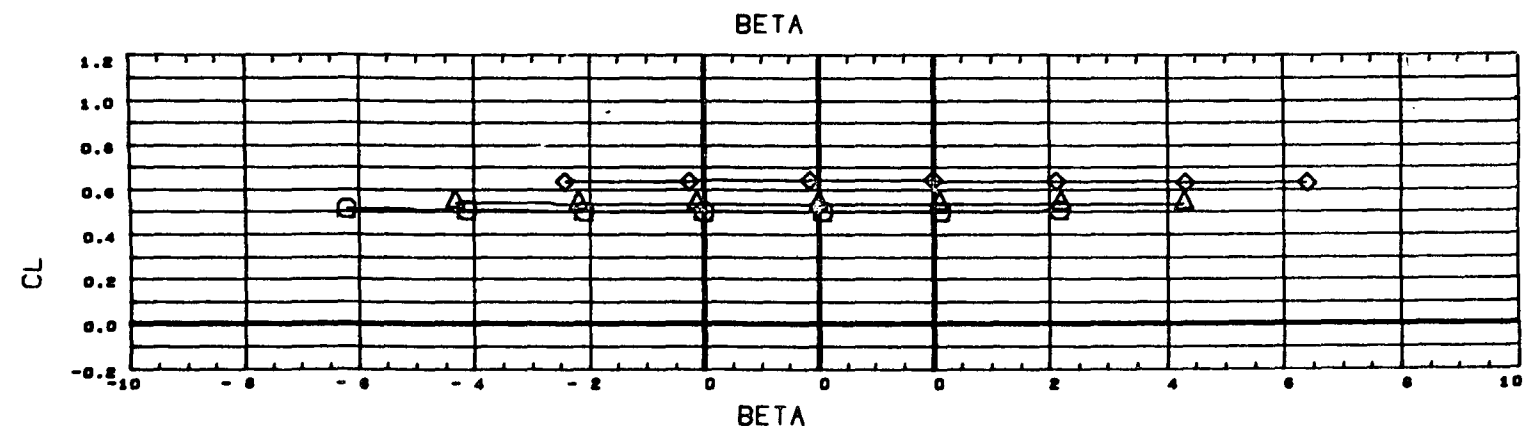
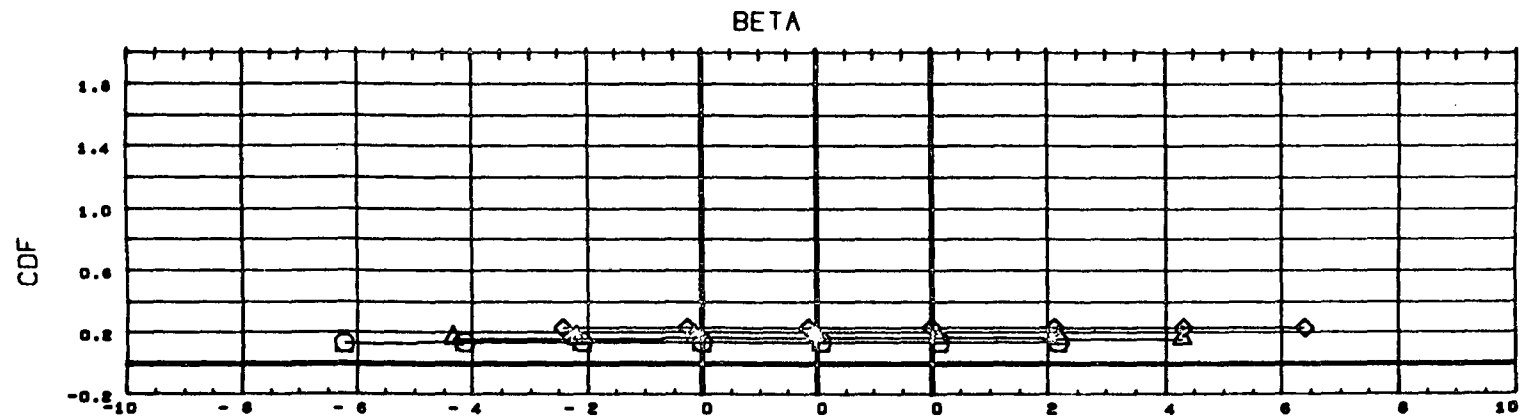
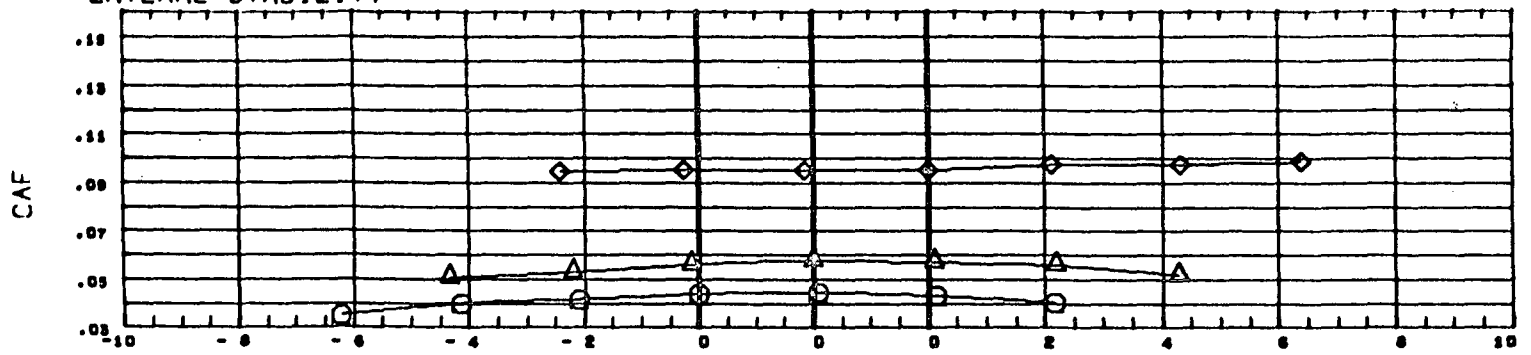
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SYMBOL	PARAMETRIC VALUES				REFERENCE INFORMATION		
	MACH	ALPHA	RUDDER		SREF		
□	0.993	10.000	0.000		14.6836	38. IN.	
△	0.997	30.000			4.5060	IN.	
◇	1.201				5.6550	IN.	
					1.4621	IN.	
					0.0000	IN.	
					0.0000	IN.	
					0.0034	IN.	

LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES
○	0.595	ALPHA 10.000 RUDDER 0.000
△	0.697	RUDFLR 30.000
◇	1.201	

REFERENCE INFORMATION		
SREF	14.6636	80. IN.
LREF	4.9060	IN.
BREF	9.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

M513-MSFC MODELAR1216I-2

B4W11AF2S1V7

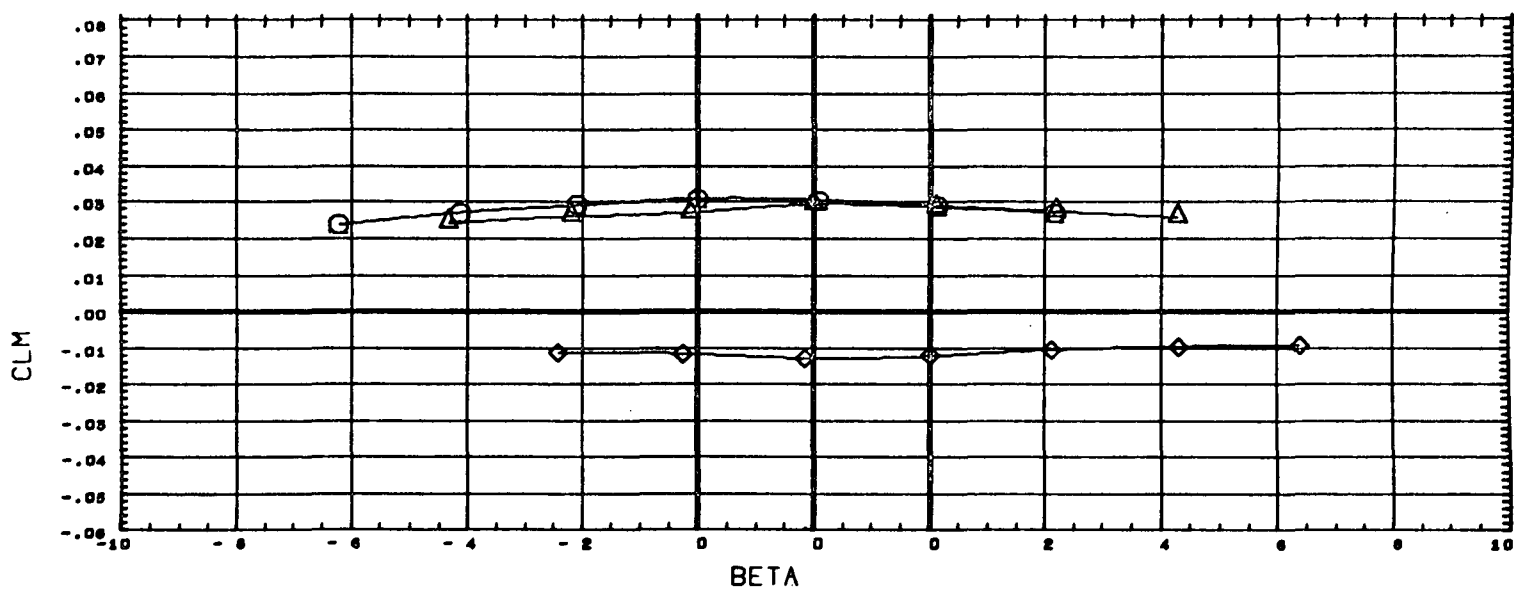
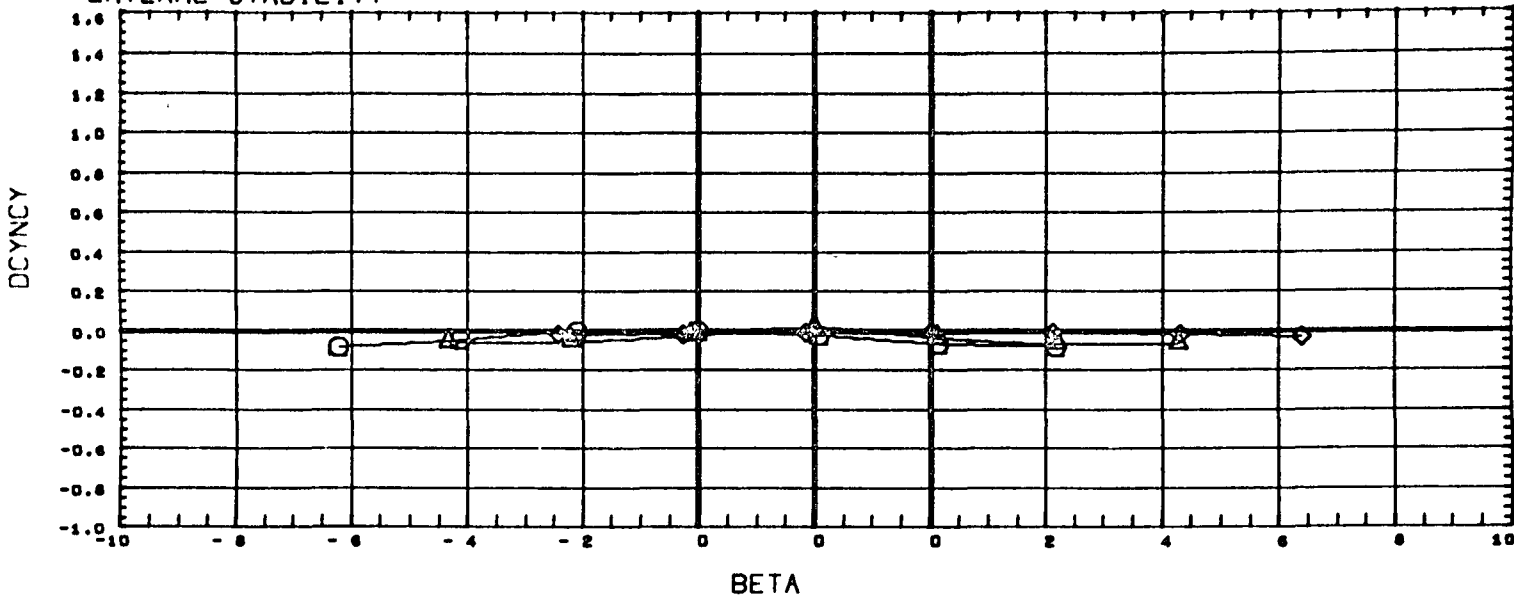
(C5329G)

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LATERAL STABILITY

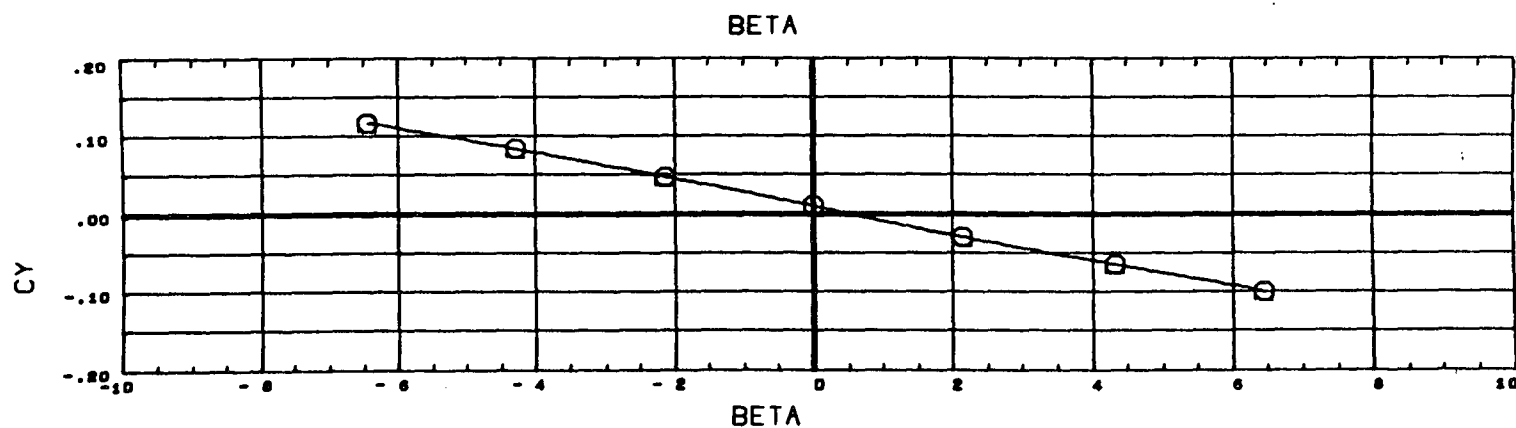
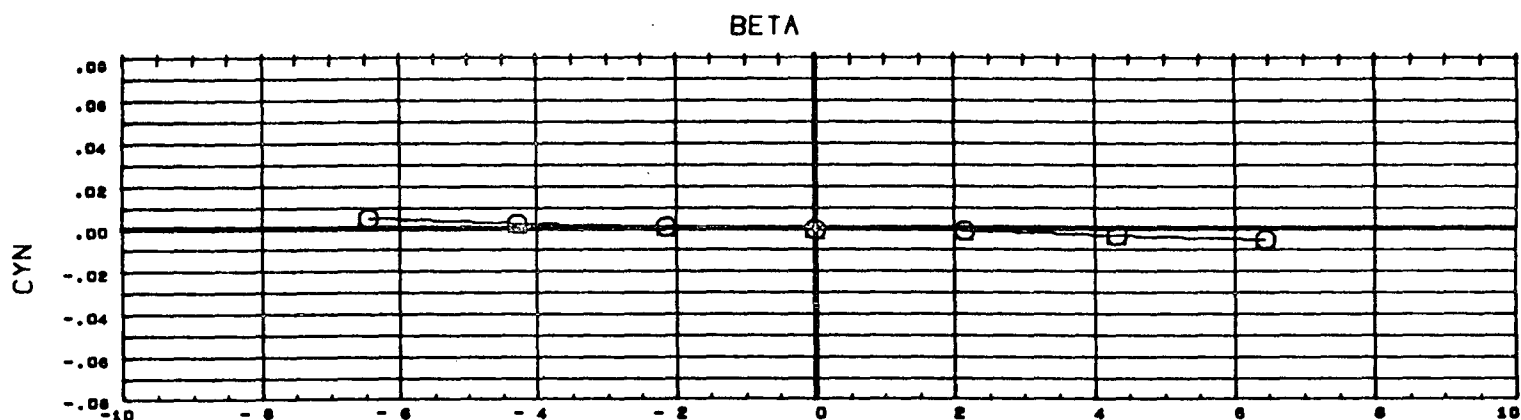
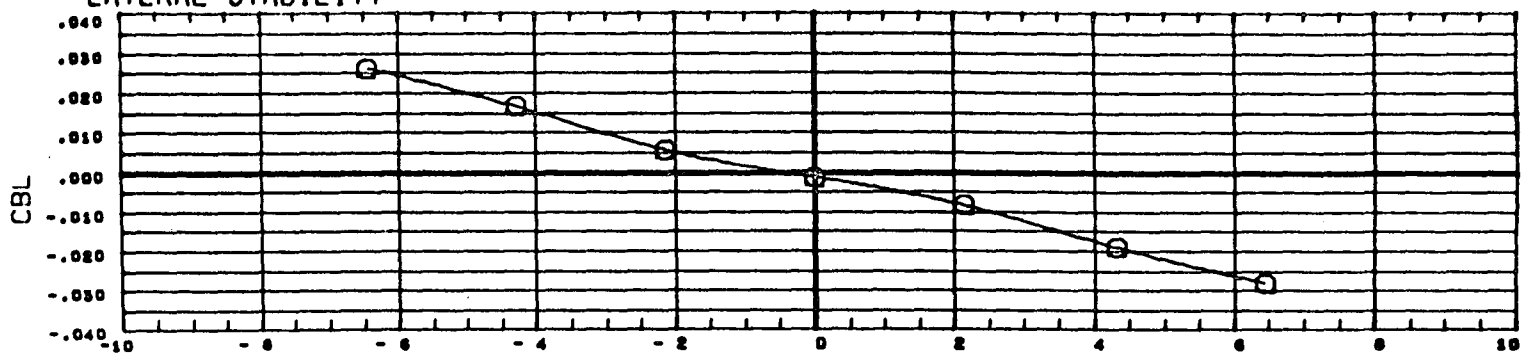


SYMBOL	MACH	PARAMETRIC VALUES		
○	0.895	ALPHA	10.000	RUDDER 0.000
△	0.897	RUDDFLR	30.000	
◇	1.201			

REFERENCE INFORMATION		
SREF	14.6836	80. IN.
LREF	4.5060	IN.
BREF	5.6550	IN.
YMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

LATERAL STABILITY



SYMBOL \bigcirc MACH 1.201 ALPHA 15.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 SQ. IN.
 LREF 4.9080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

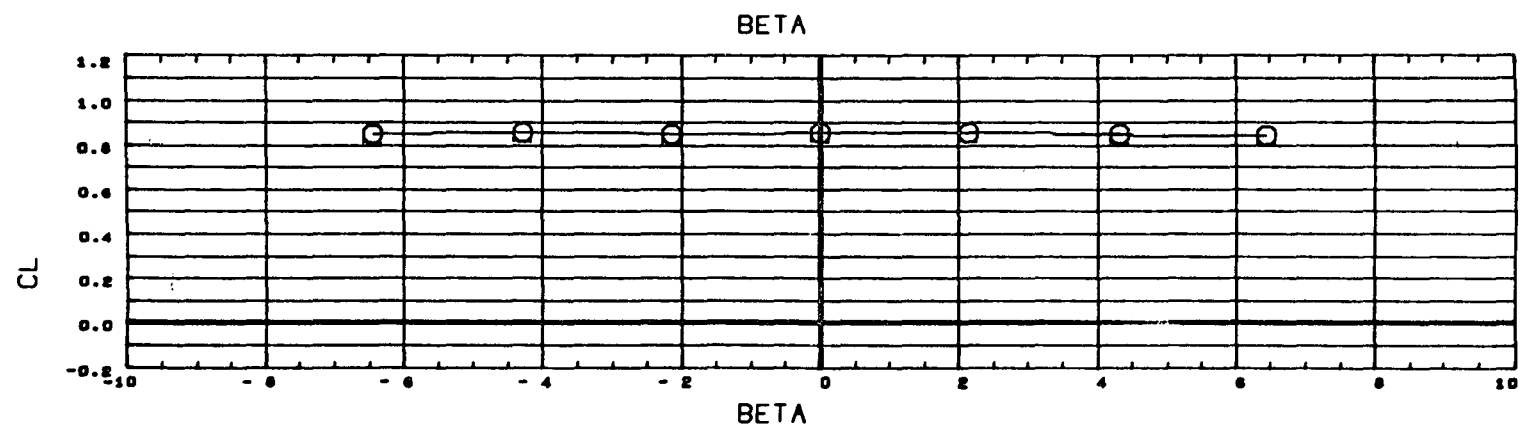
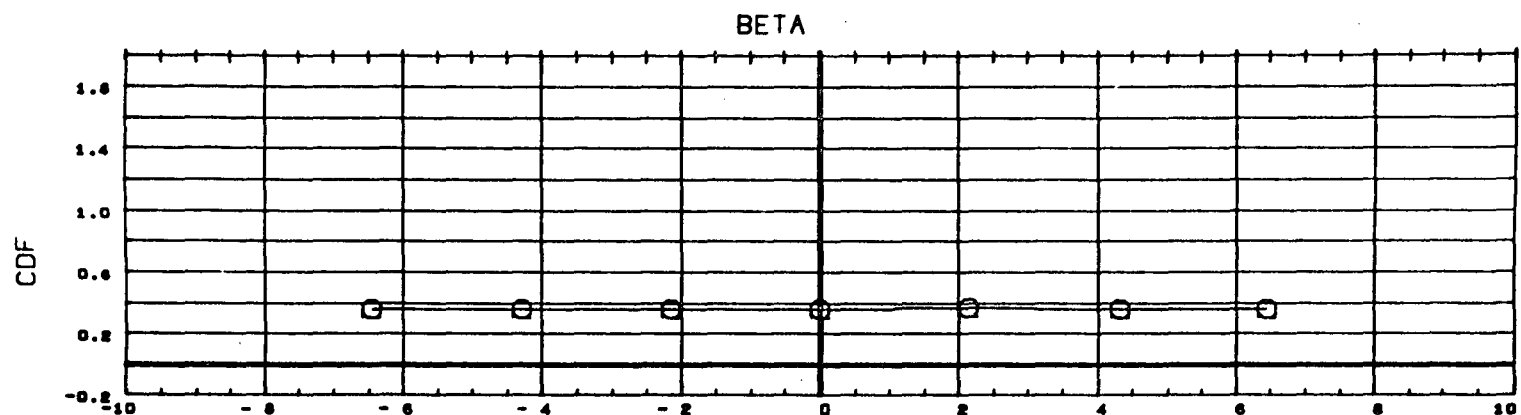
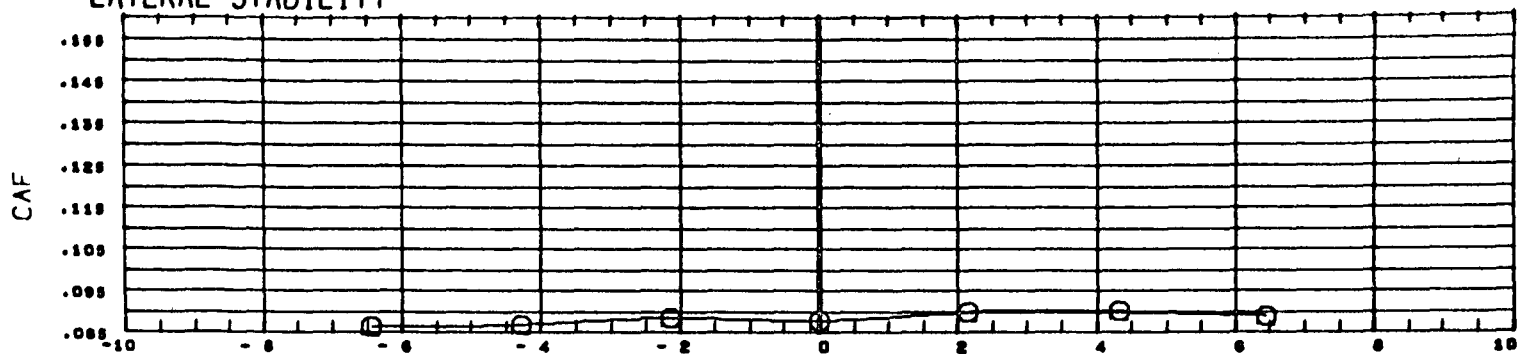
M513-MSFC MODELAR1216I-2

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LATERAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 O 1.201 ALPHA 15.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6636 80. IN.
 LREF 4.5080 IN.
 BREF 9.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

M513-MSFC MODELAR1216I-2

B4W11AF2S1V7

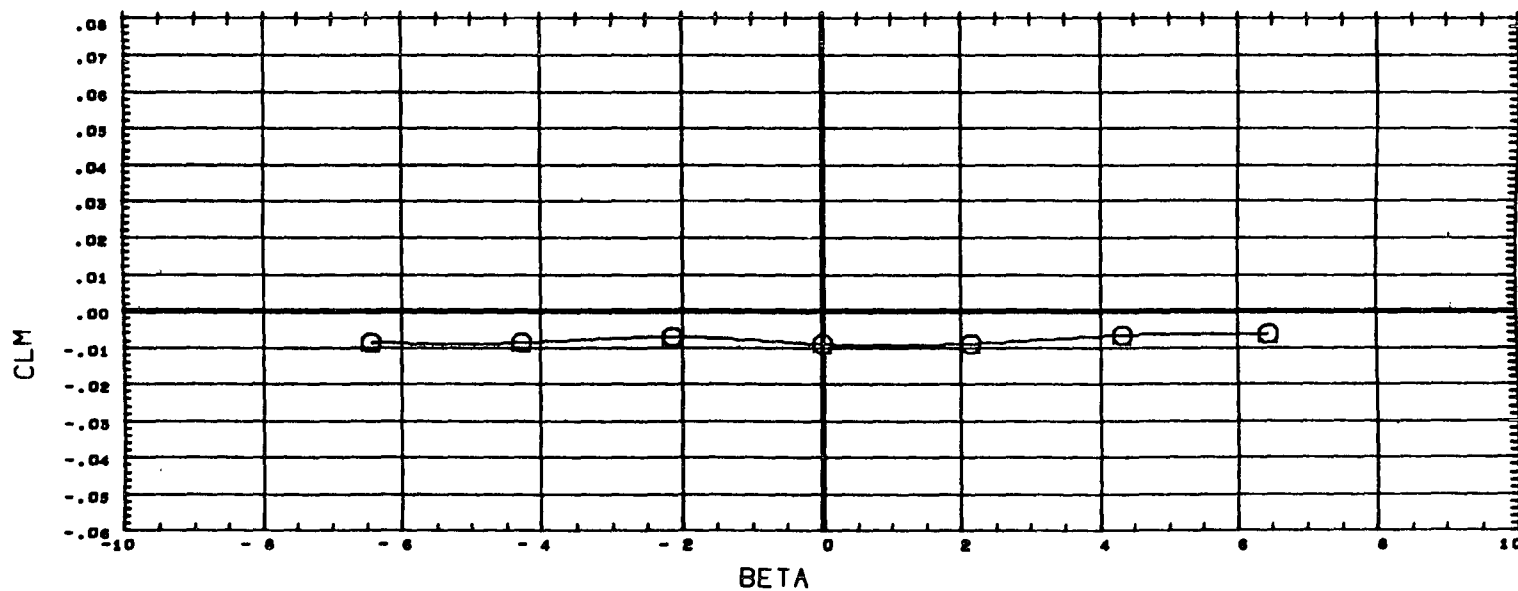
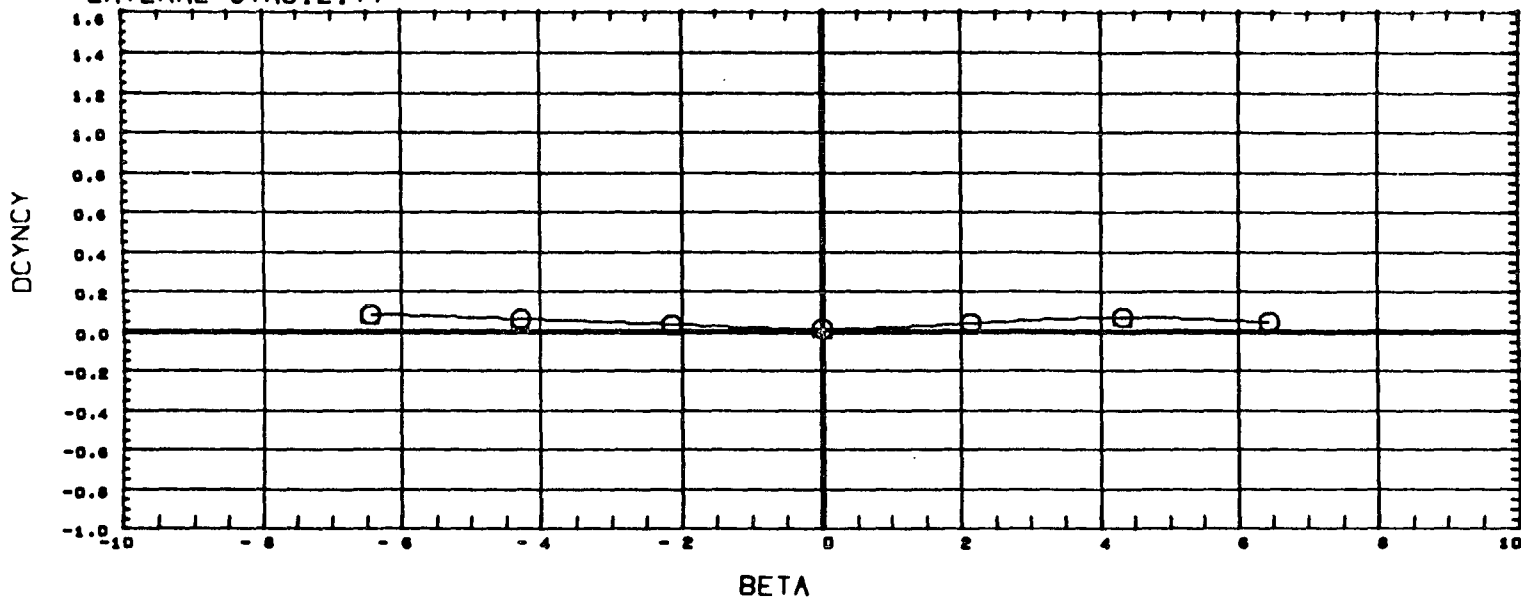
(C5329H)

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LATERAL STABILITY

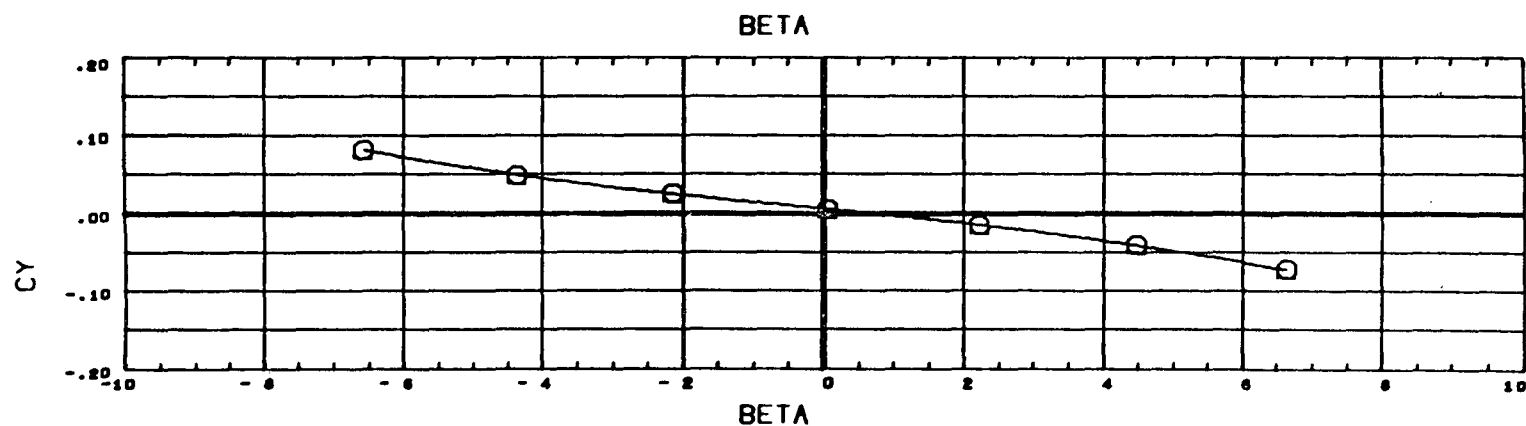
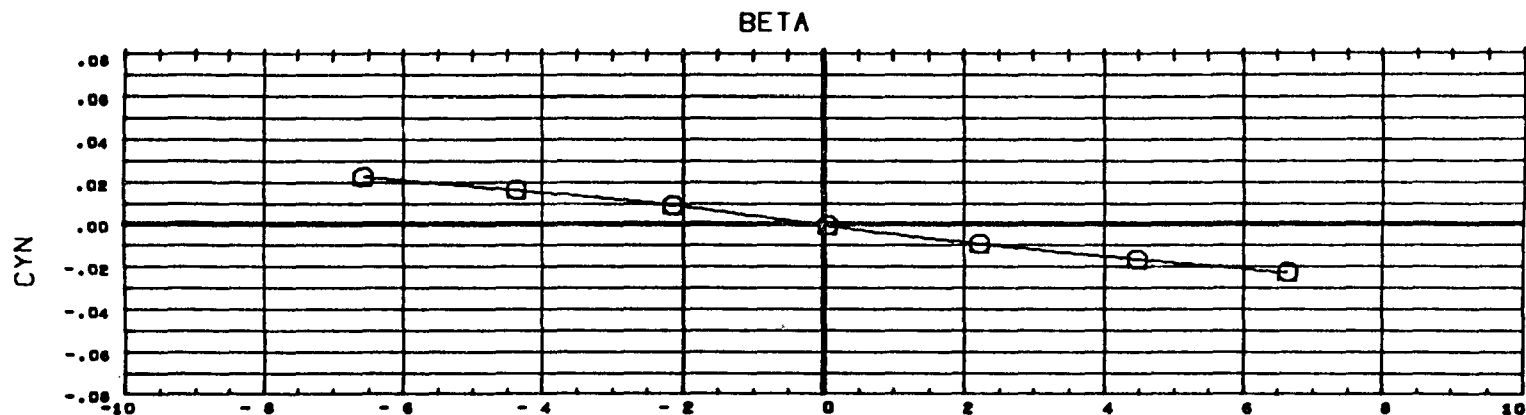
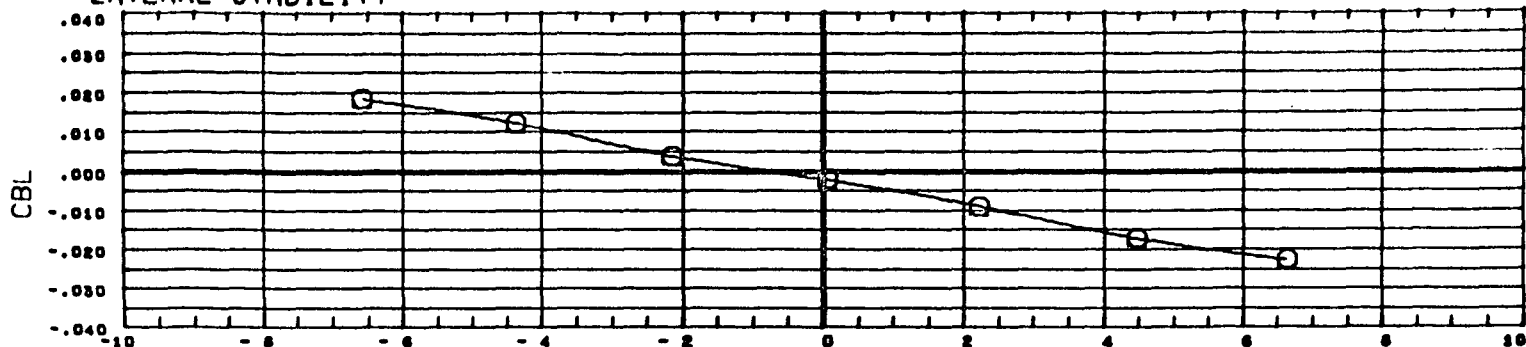


SYMBOL	MACH	PARAMETRIC VALUES		
○	1.201	ALPHA	15.000	RUDDER 0.000
		RUDFLR	30.000	

REFERENCE INFORMATION		
SREF	14.6836	80. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

LATERAL STABILITY



SYMBOL \bigcirc MACH 1.964 ALPHA 25.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6036 80. IN.
 LREF 4.5060 IN.
 BREF 5.6550 IN.
 XHRP 1.4621 IN.
 YHRP 0.0000 IN.
 ZHRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

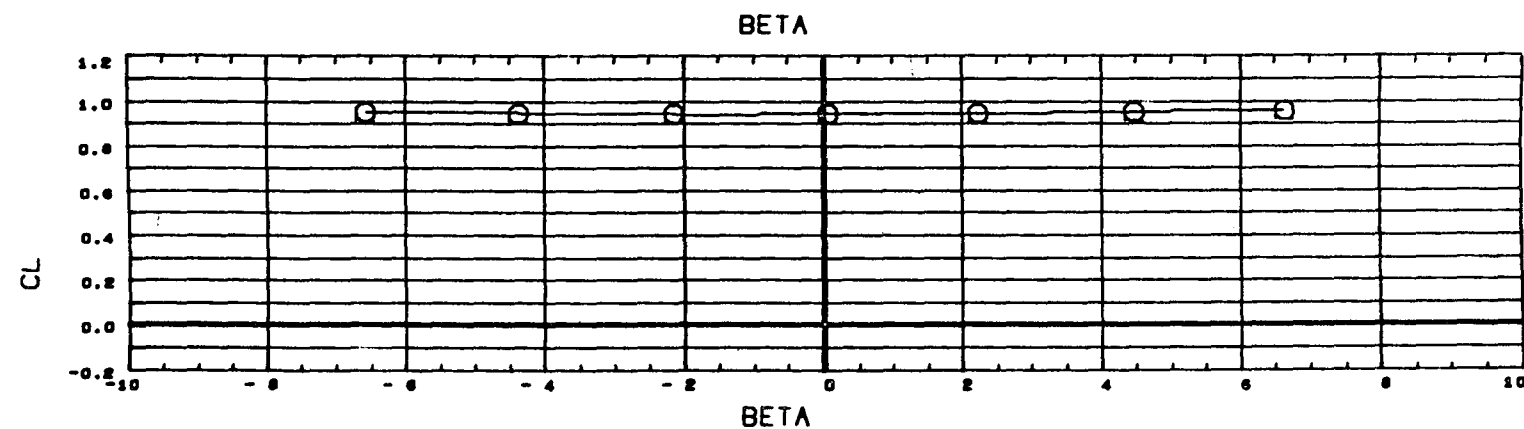
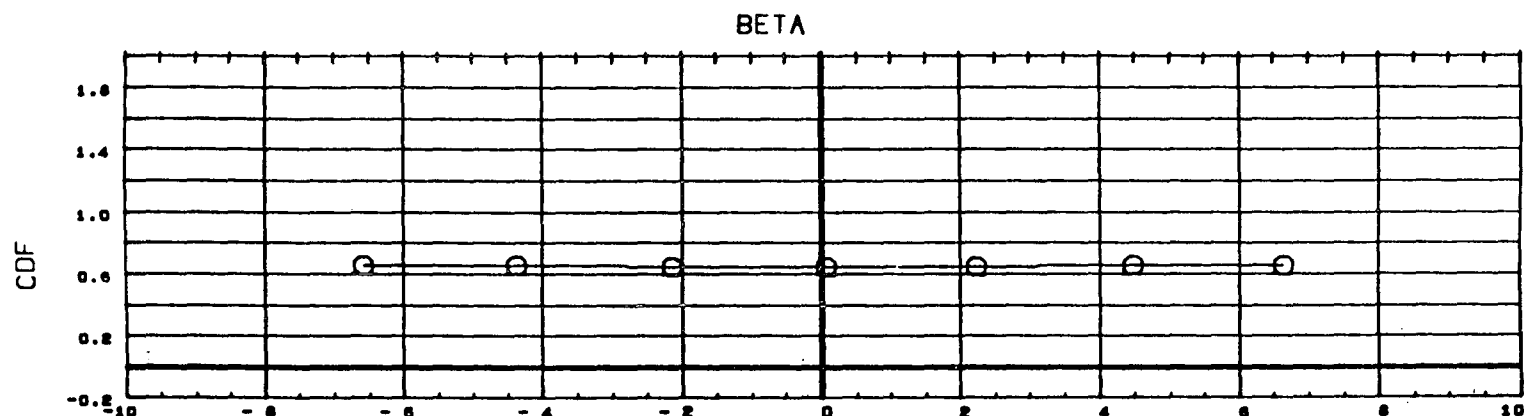
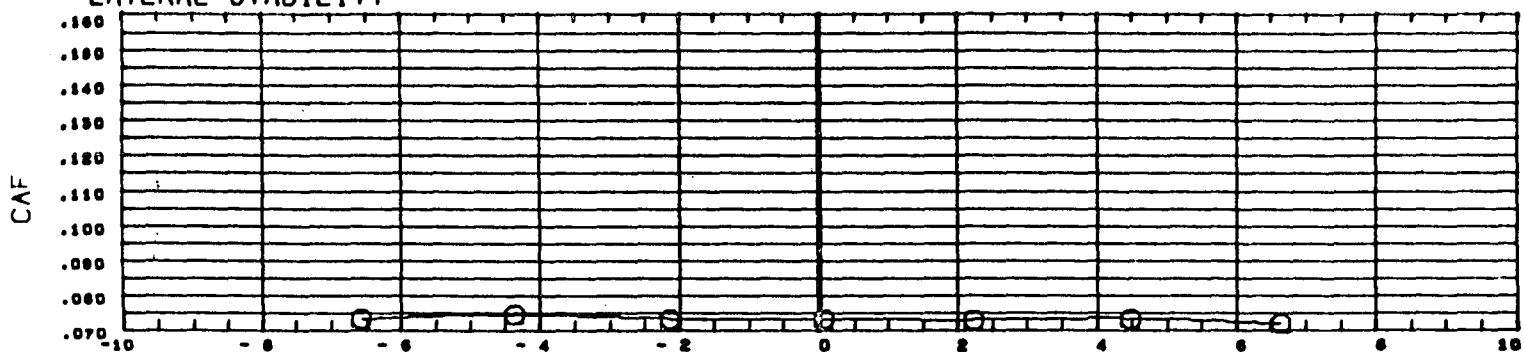
M513-MSFC MODELAR12161-2

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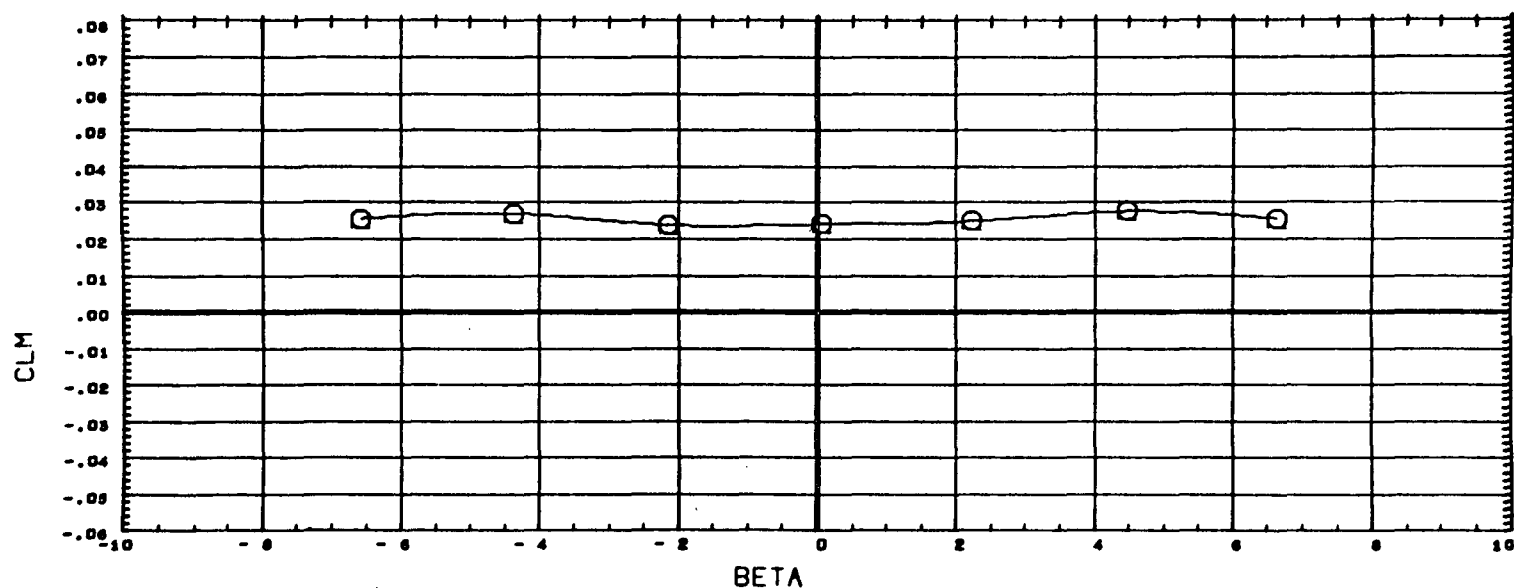
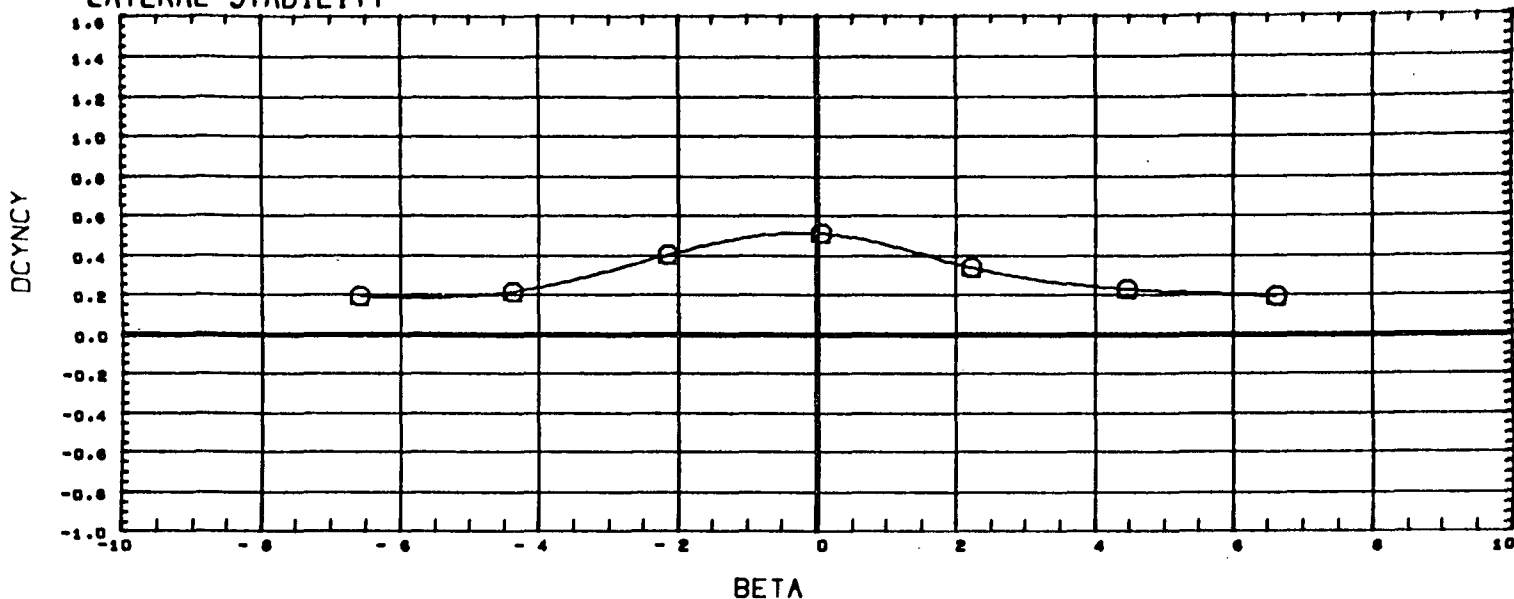


SYMBOL MACH 1.064
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 RUDFLR 30.000

DATA HIST. CODE GC

REFERENCE INFORMATION
 SREF 14.6836 59. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

LATERAL STABILITY



SYMBOL \bigcirc MACH 1.964
 PARAMETRIC VALUES
 ALPHA 25.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 89. IN.
 LREF 4.9080 IN.
 BREF 5.6350 IN.
 XHRP 1.4821 IN.
 YHRP 0.0000 IN.
 ZHRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

M513-MSFC MODELAR1216I-2

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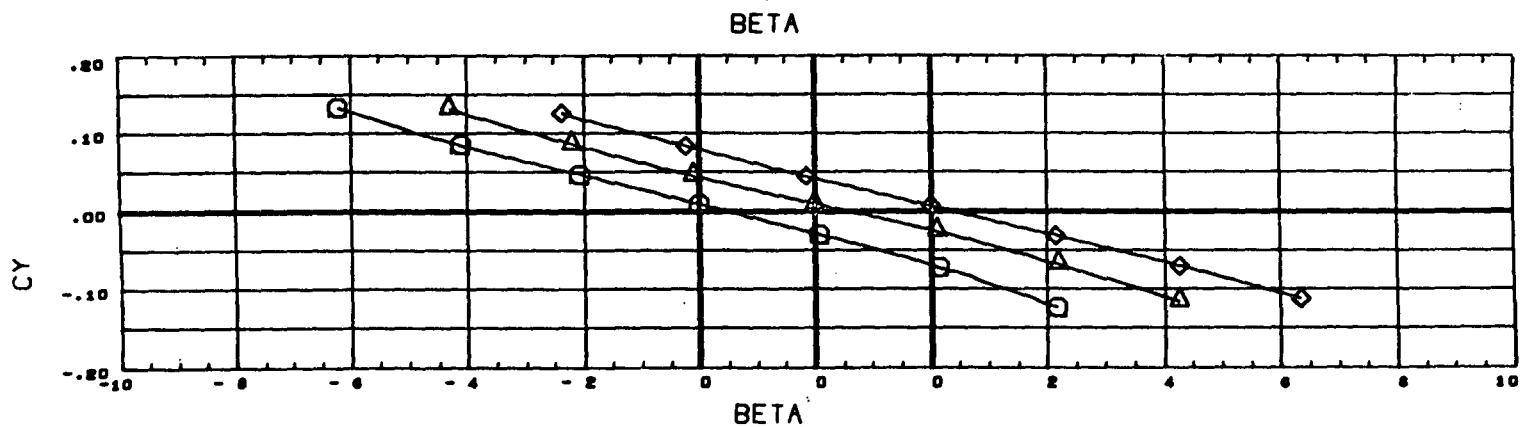
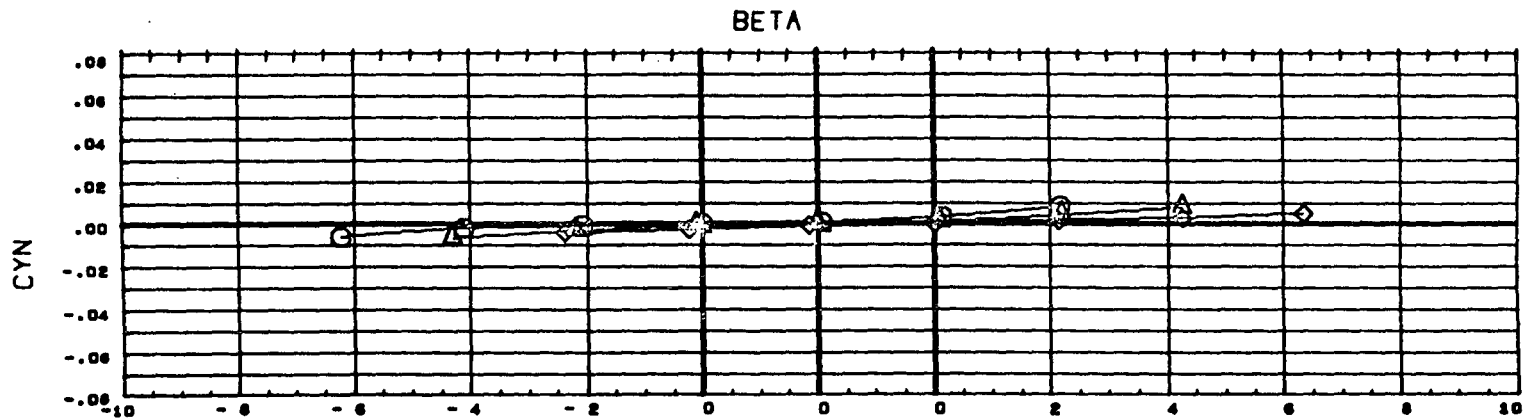
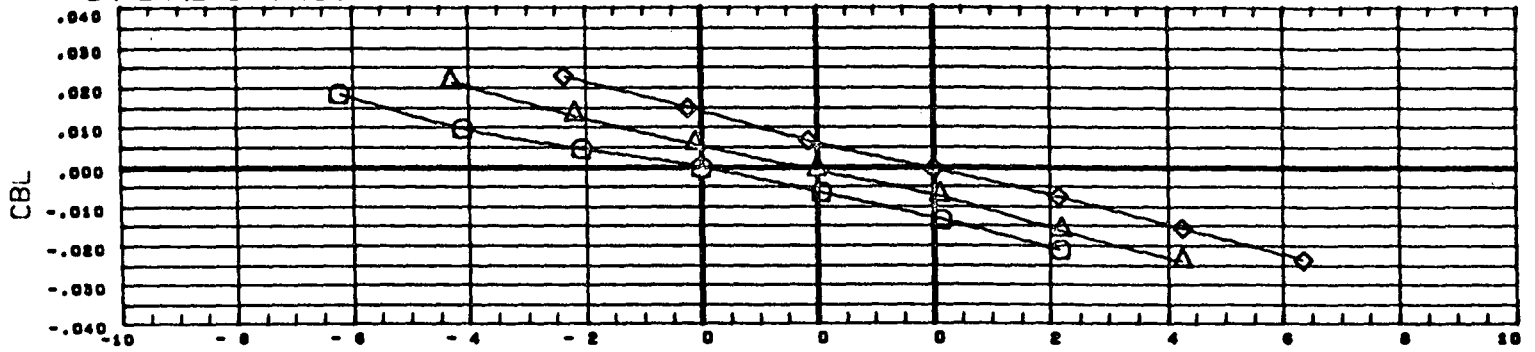
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LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	0.598	ALPHA	10.000	RUDDER	0.000
△	0.898	RUDDLR	30.000		
◇	1.193				

REFERENCE INFORMATION		
SREF	14.6836	89 IN.
LREF	4.5040	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

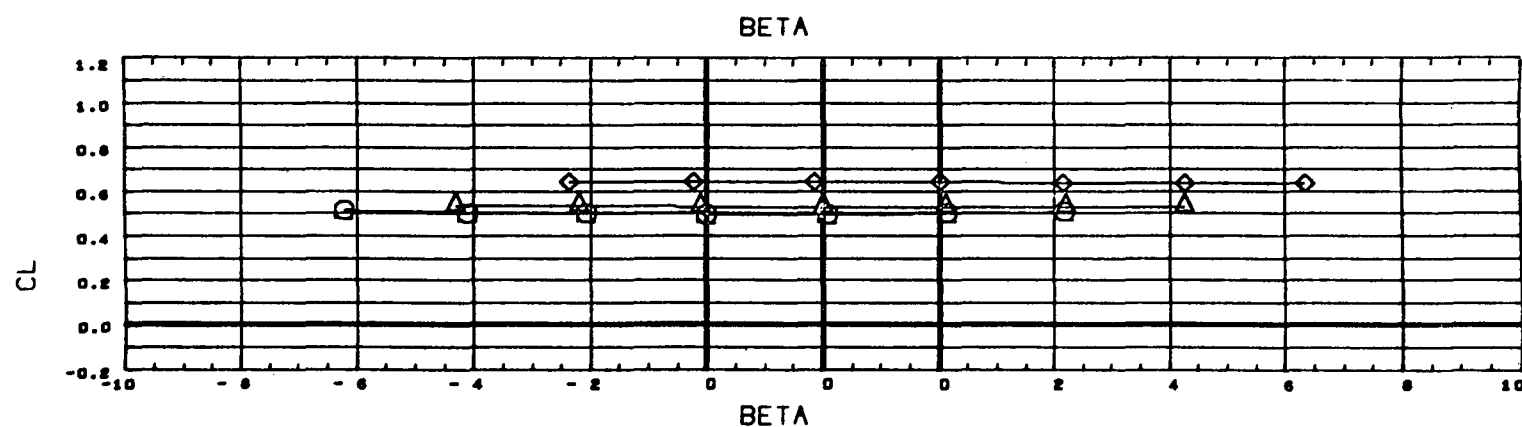
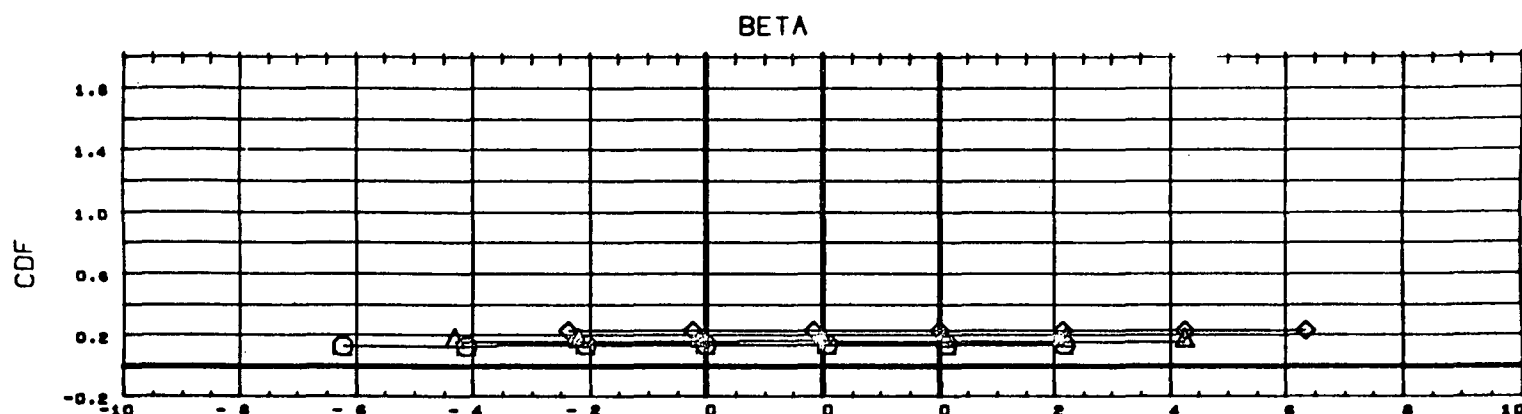
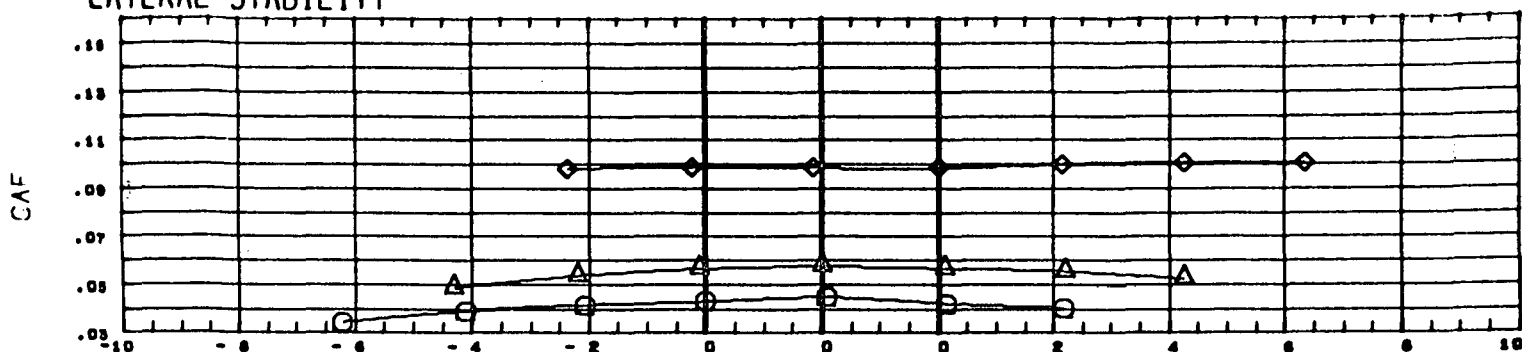
M513-MSFC MODELAR1216I-2

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LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
○	0.598	ALPHA	10.000	RUDDER 0.000
△	0.698	RUDDLR	30.000	
◇	1.193			

REFERENCE INFORMATION		
SREF	14.6836	80. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

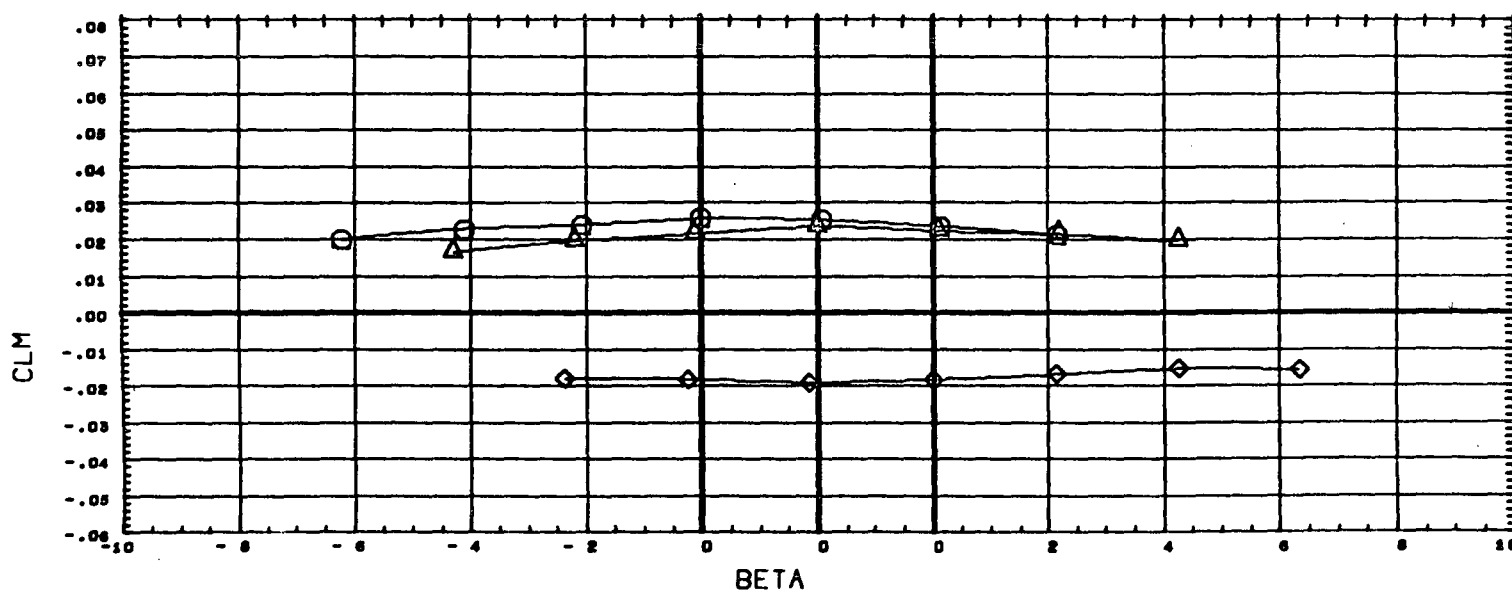
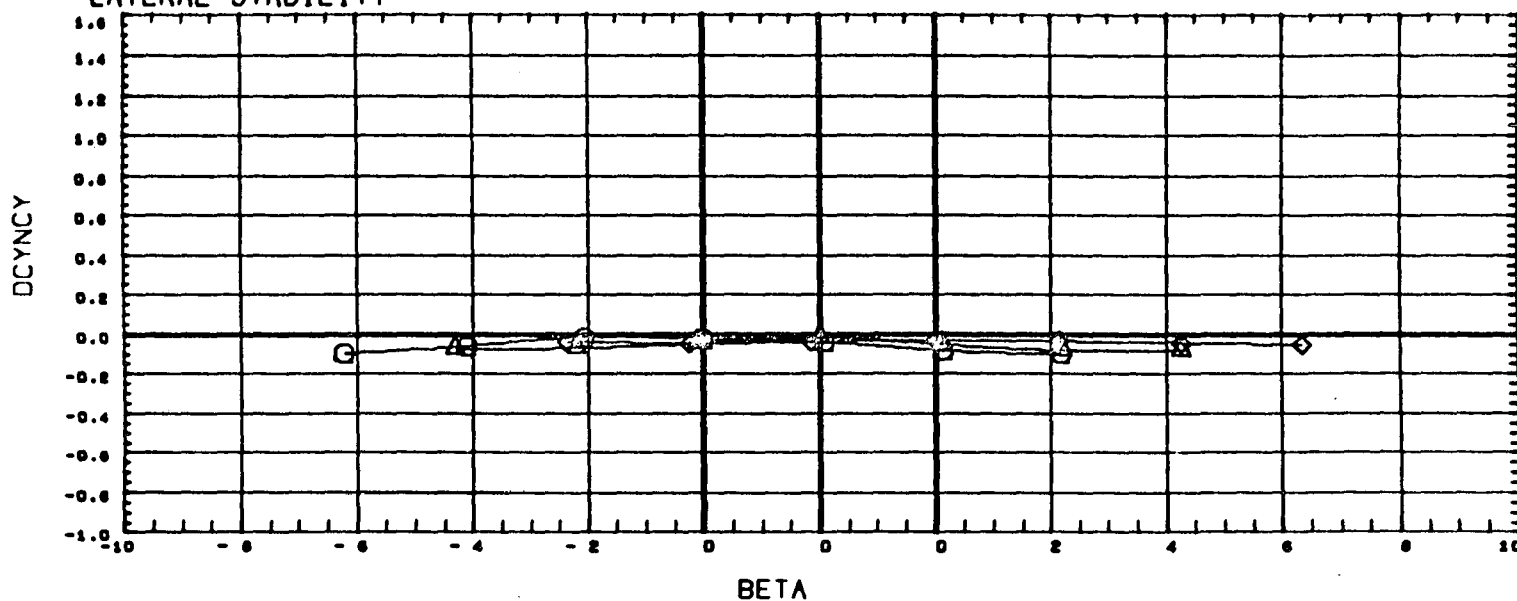
M513-MSFC MODELAR12161-2

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LATERAL STABILITY

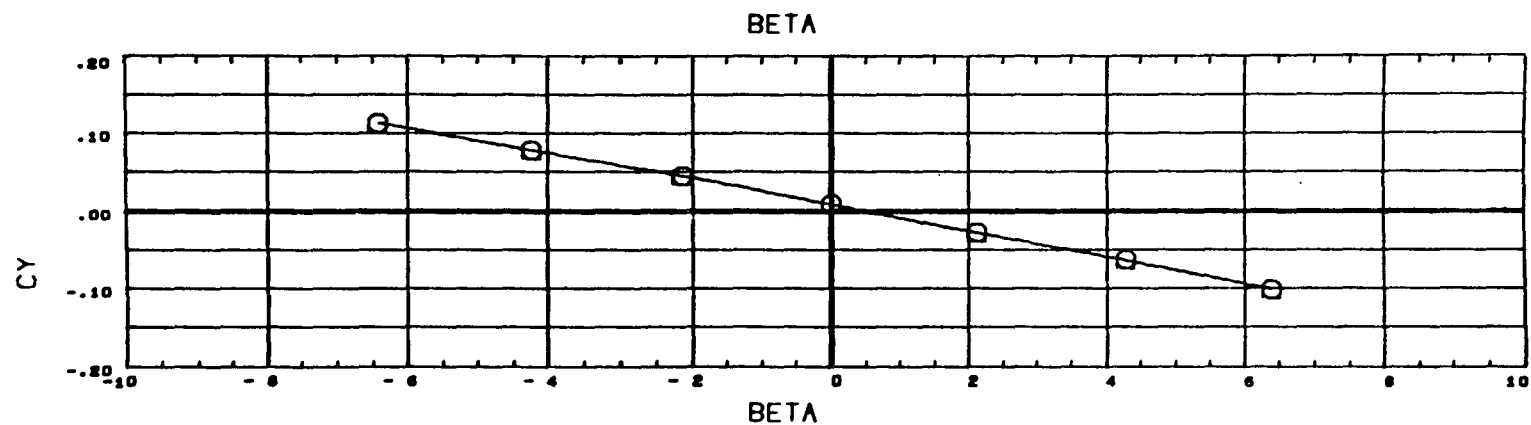
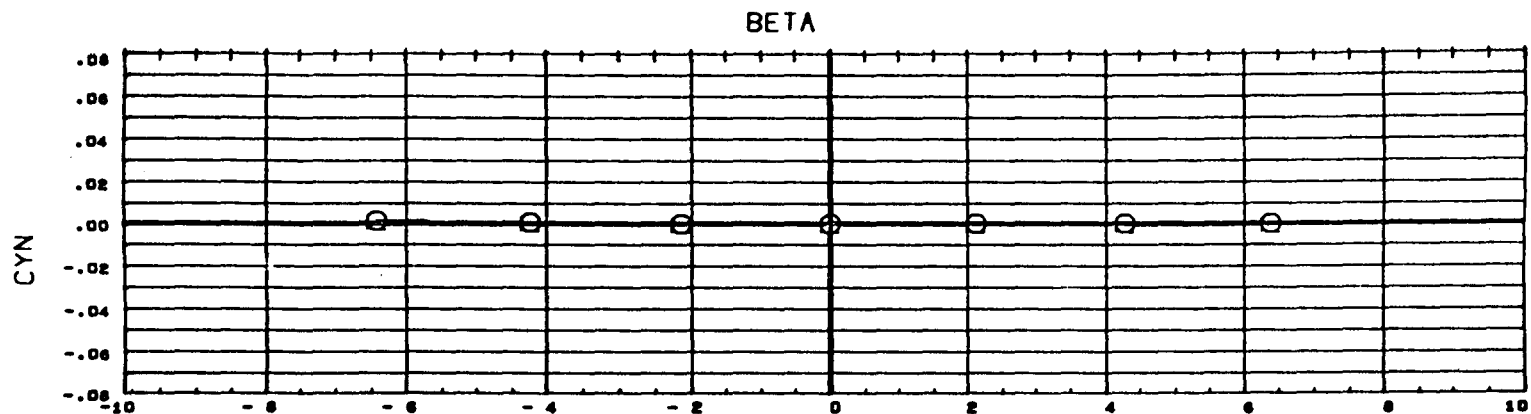
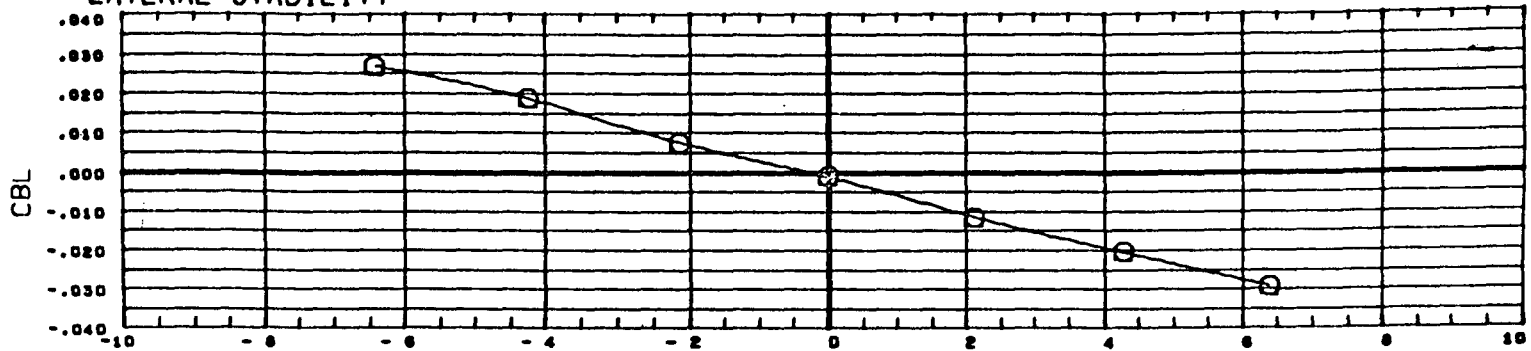


SYMBOL	MACH	PARAMETRIC VALUES		
○	0.596	ALPHA	10.000	RUDDER 0.000
△	0.898	RUDFLR	30.000	
◇	1.193			

REFERENCE INFORMATION		
SREF	14.6836	88. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE 6C

LATERAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 O 1.196 ALPHA 15.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 58. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

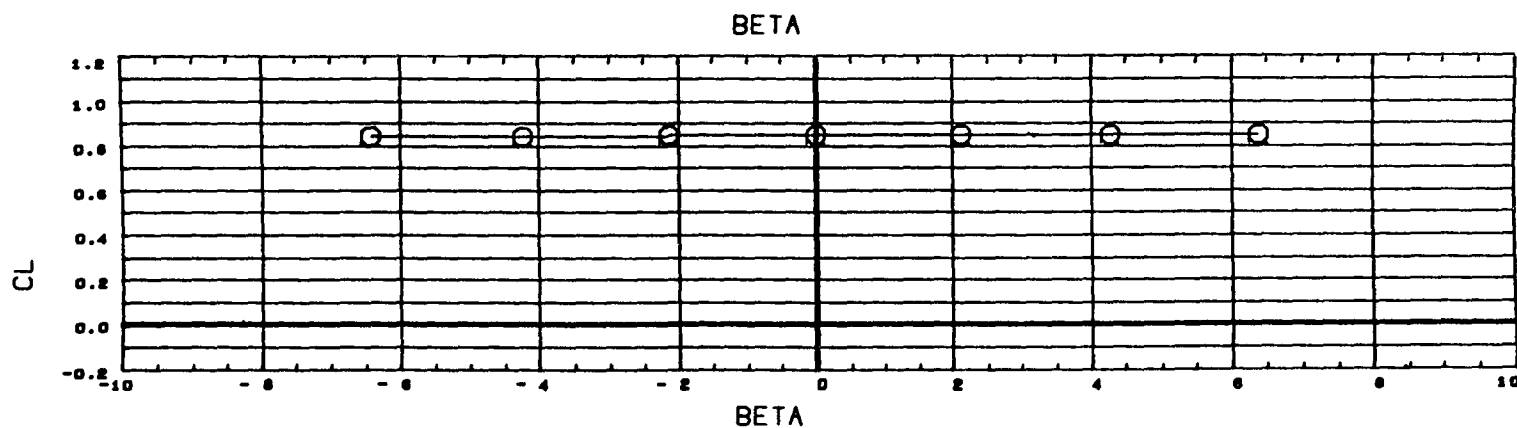
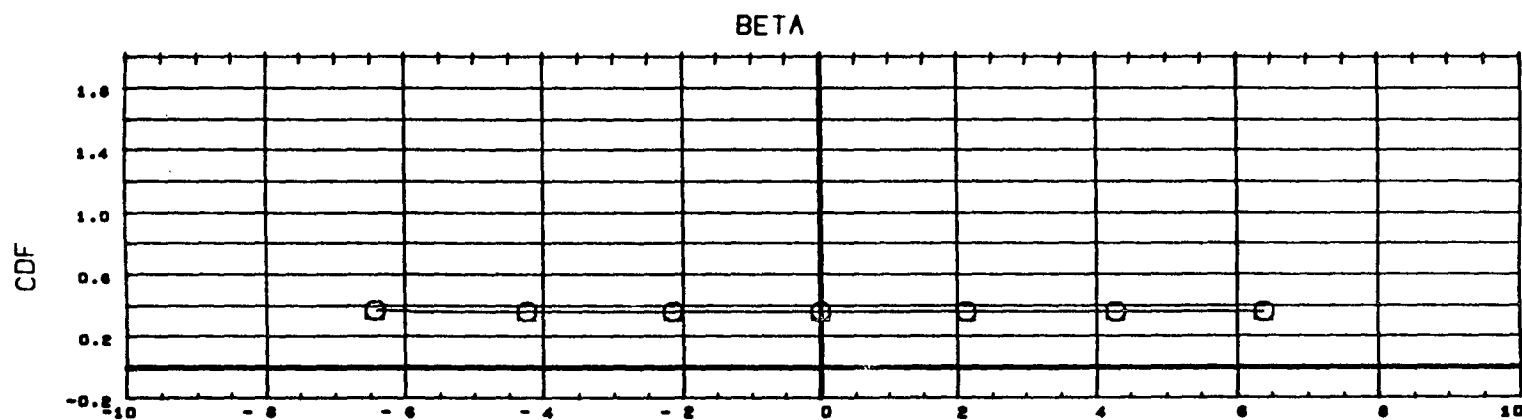
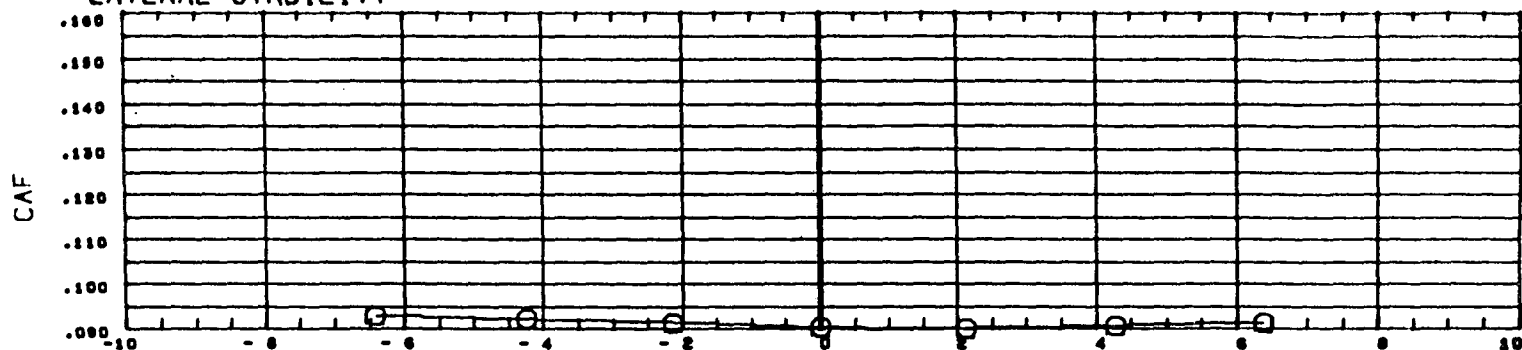
M513-MSFC MODELAR12161-2

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LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	1.196	ALPHA	15.000	RUDDER	0.000
		RUDFLR	30.000		

REFERENCE INFORMATION		
SREF	14.6836	50. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE 6C

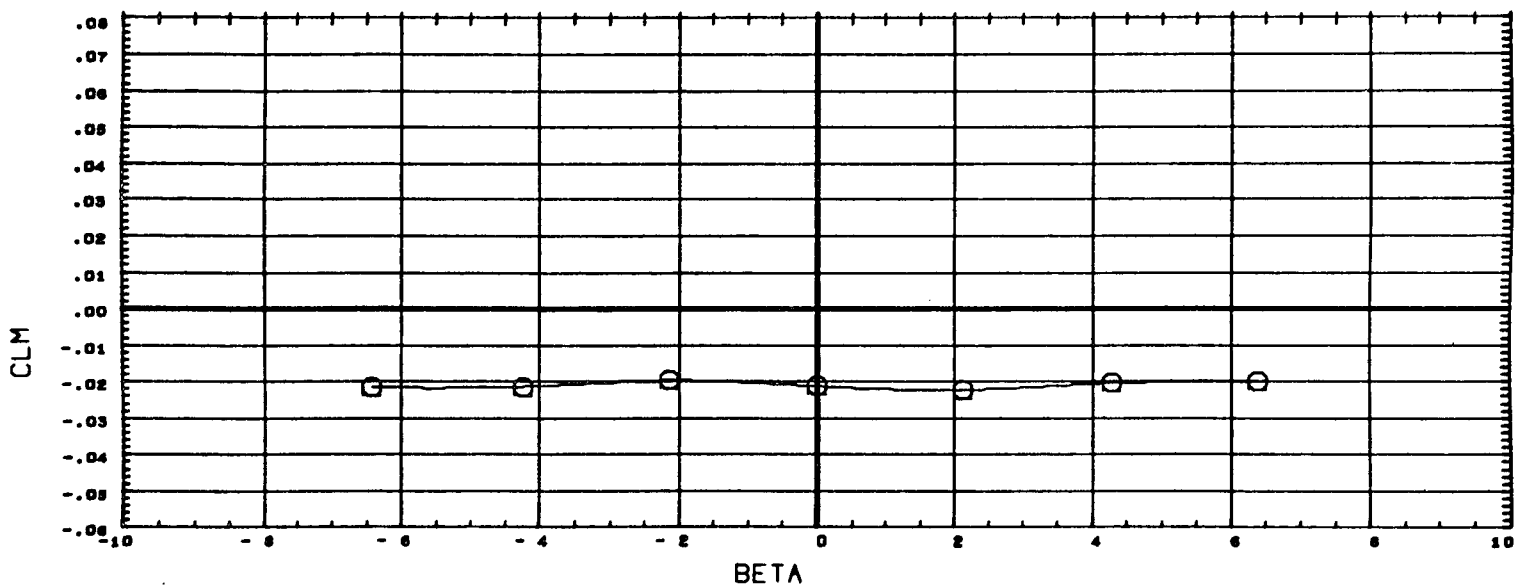
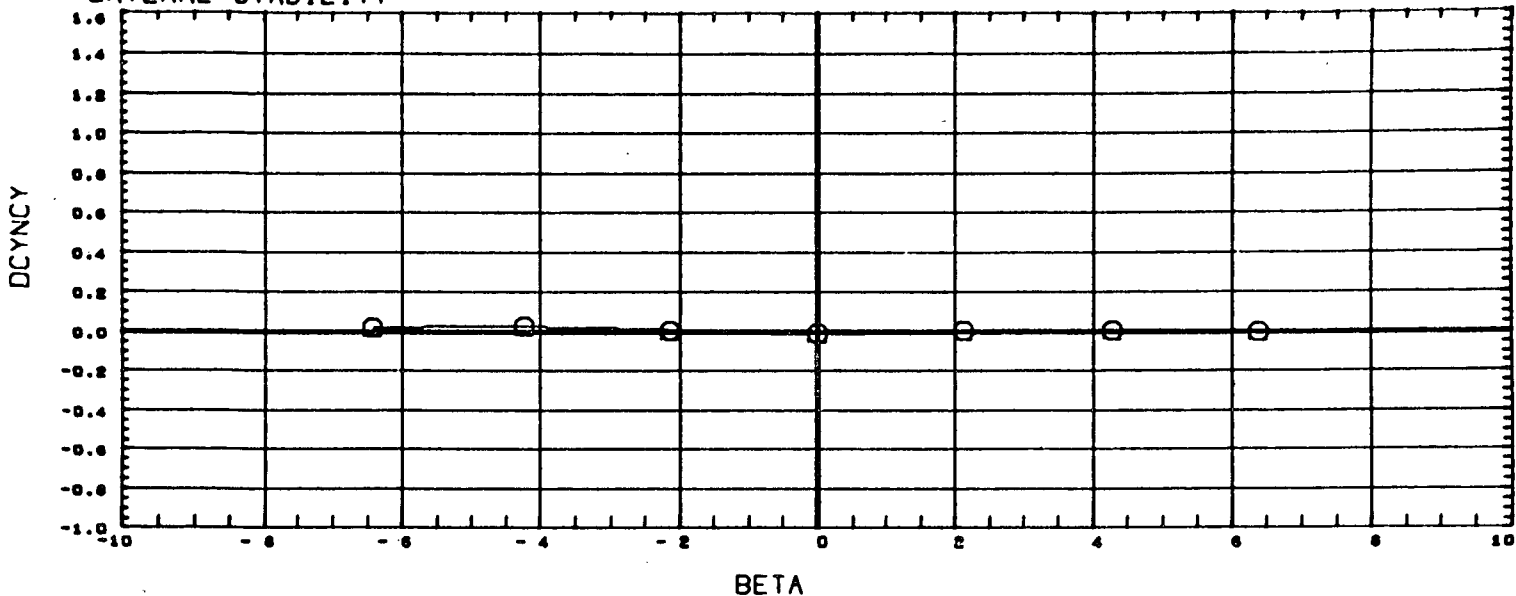
M513-MSFC MODELAR1216I-2

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LATERAL STABILITY



SYMBOL \bigcirc MACH 8.196
 PARAMETRIC VALUES
 ALPHA 15.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

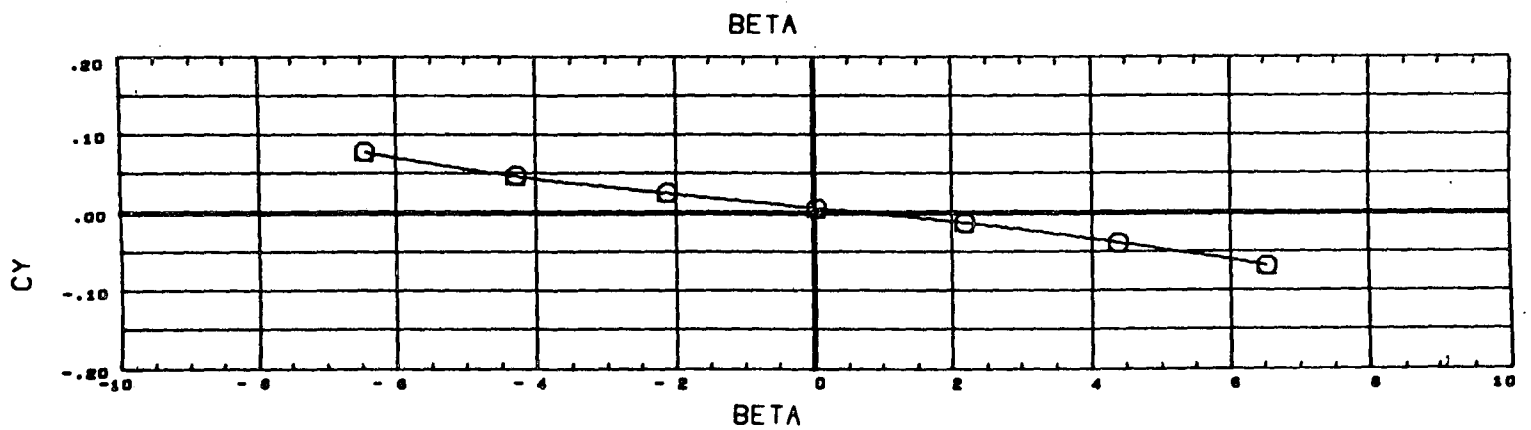
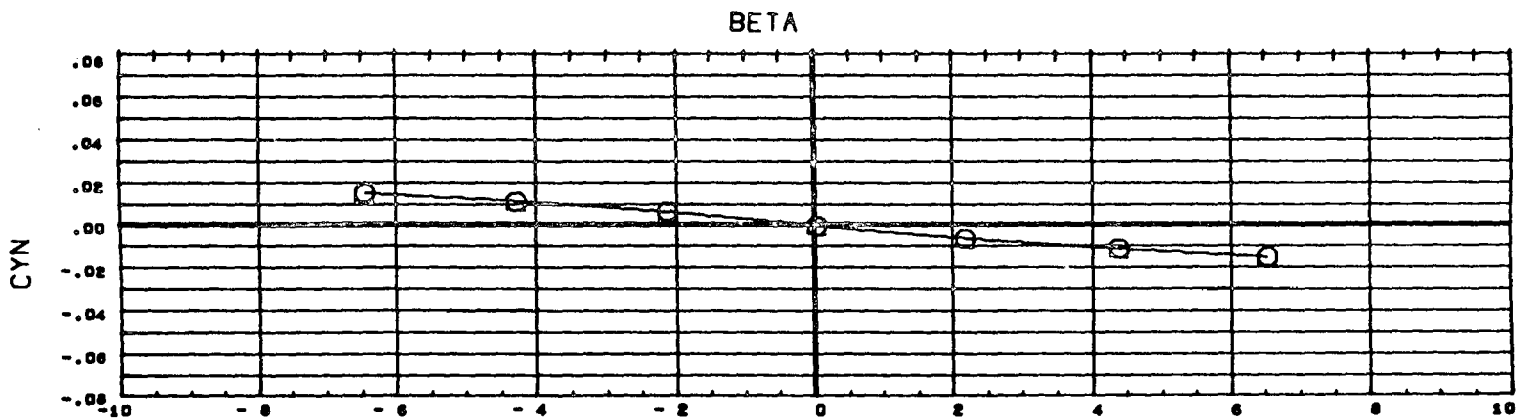
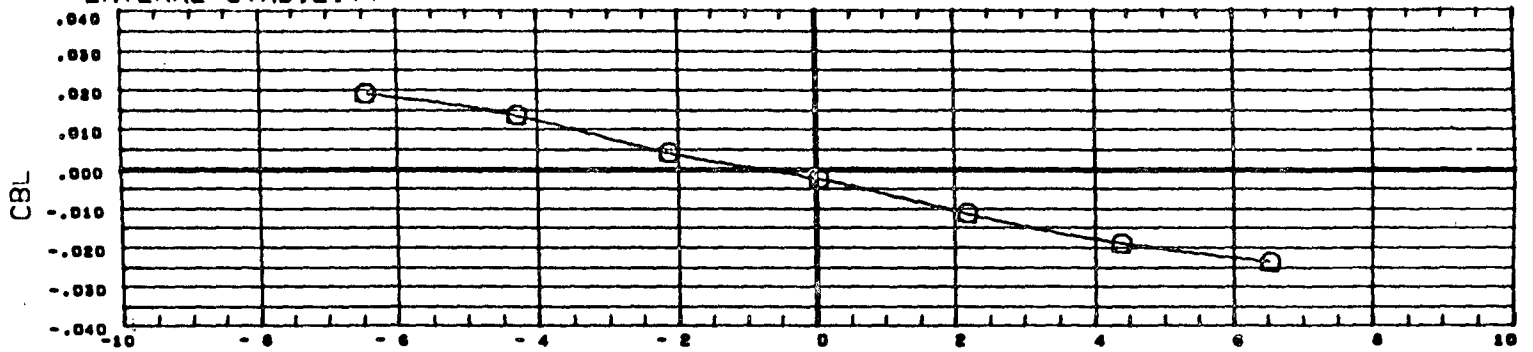
M513-MSFC MODELAR1216I-2

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LATERAL STABILITY



SYMBOL \bigcirc MACH 1.985 ALPHA 25.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 89. IN.
 LREF 4.9080 IN.
 BREF 9.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

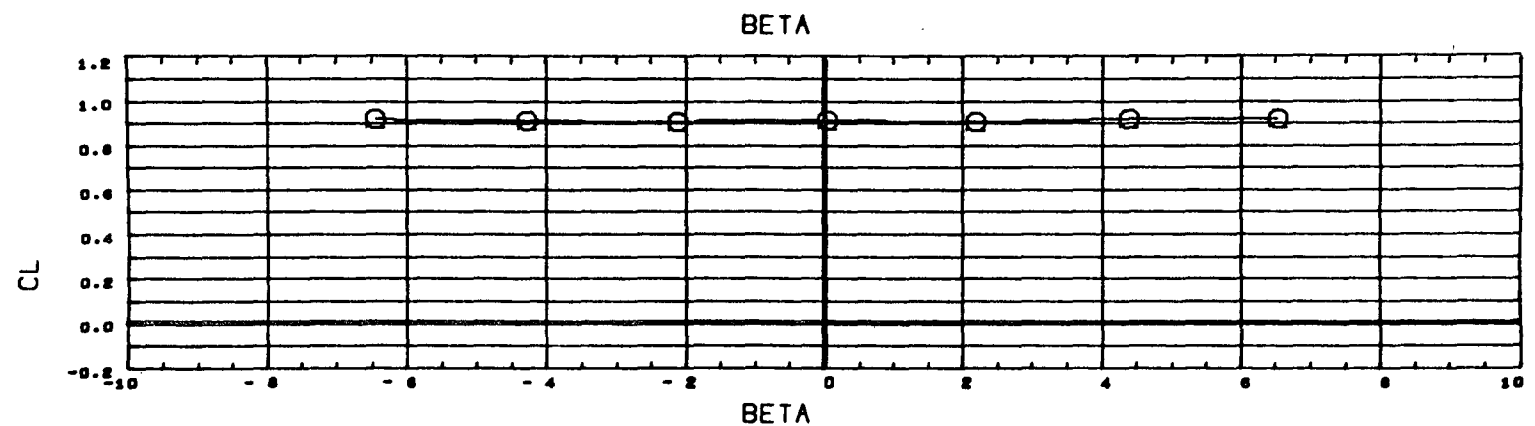
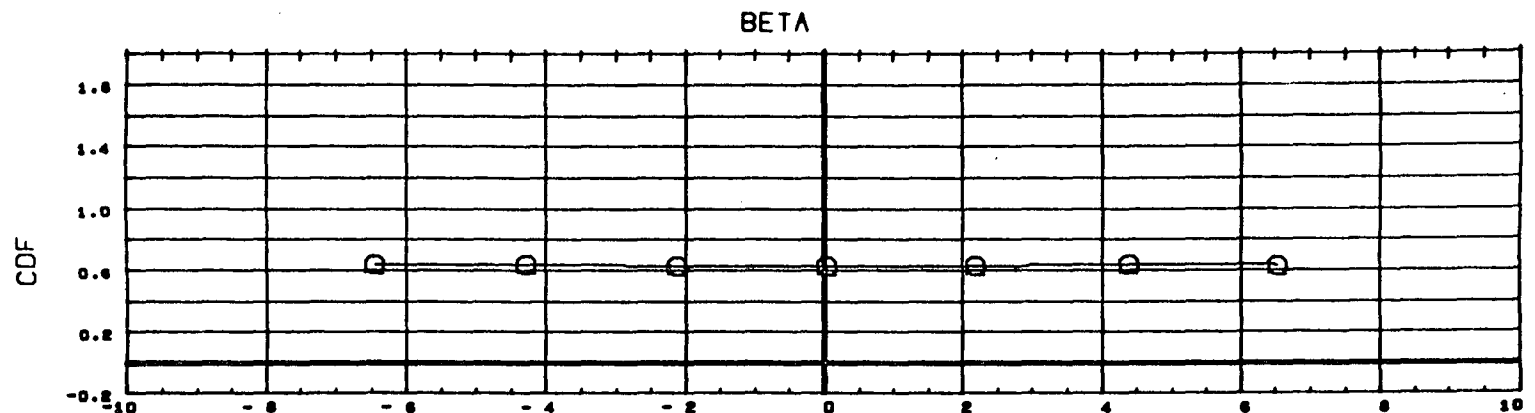
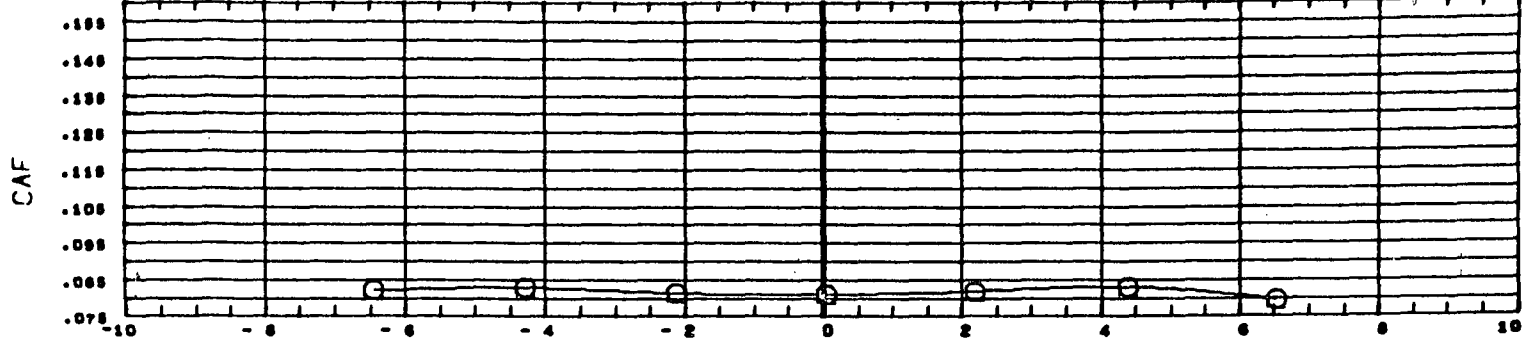
M513-MSFC MODELAR1216I-2

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LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	1.965	ALPHA	25.000	RUDDER	0.000
		RUOFLR	30.000		

REFERENCE INFORMATION		
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LREF	4.5060	IN.
BREF	5.6350	IN.
XNRP	1.4821	IN.
YNRP	0.0000	IN.
ZNRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

M513-MSFC MODELAR12161-2

B5W11AF2S1V7

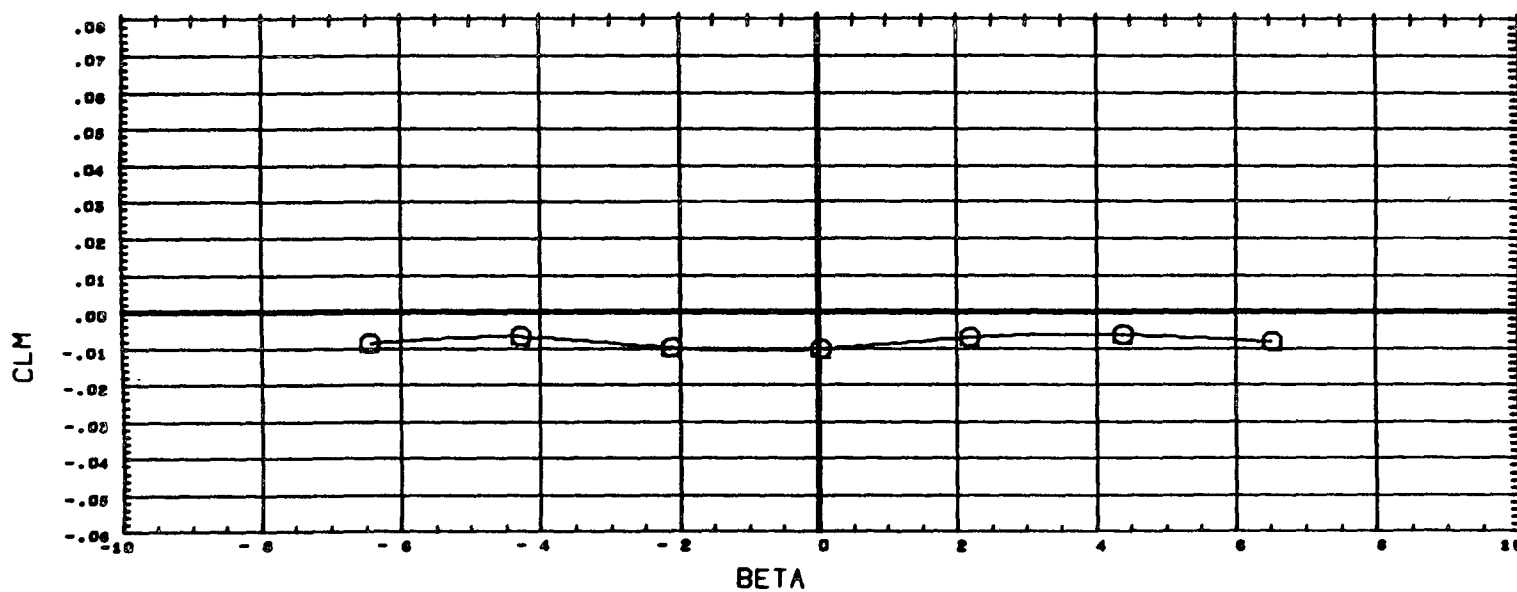
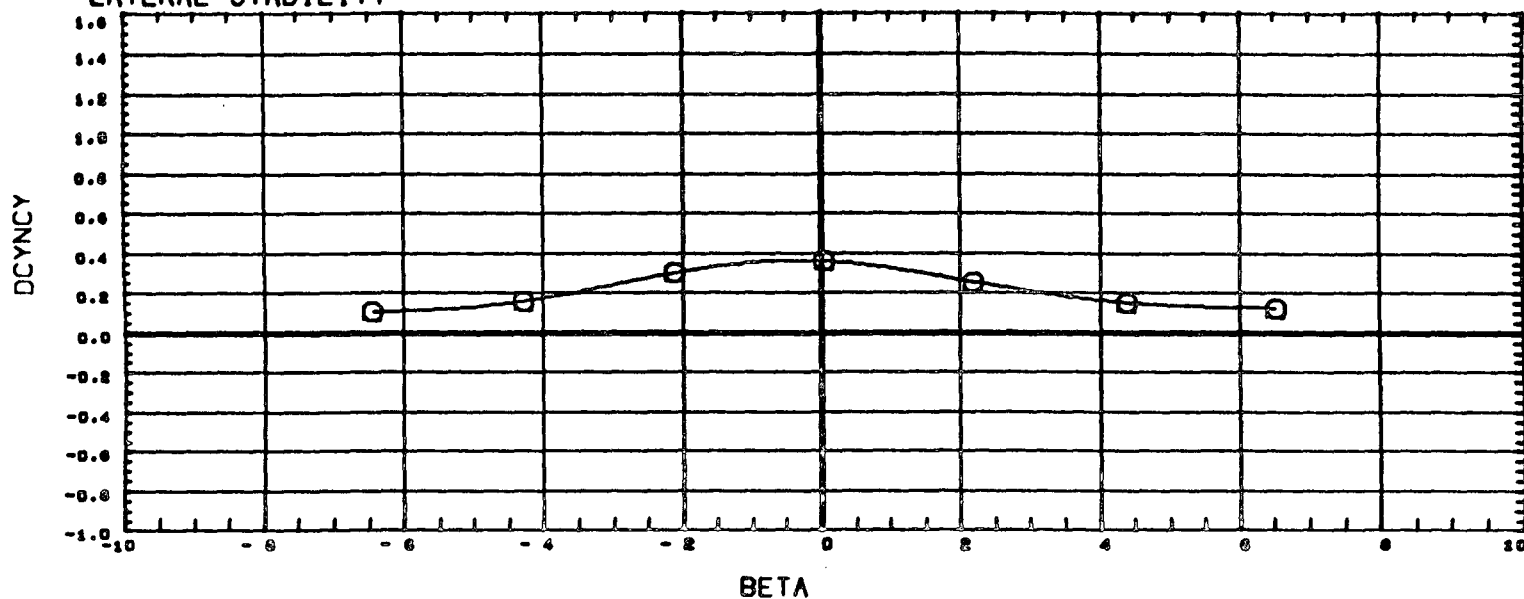
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LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
○	1.965	ALPHA	25.000	RUDDER
		RUDFLR	30.000	0.000

REFERENCE INFORMATION		
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LREF	4.5080	IN.
BREF	5.6350	IN.
XHRP	1.4021	IN.
YHRP	0.0000	IN.
ZHRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE 6C

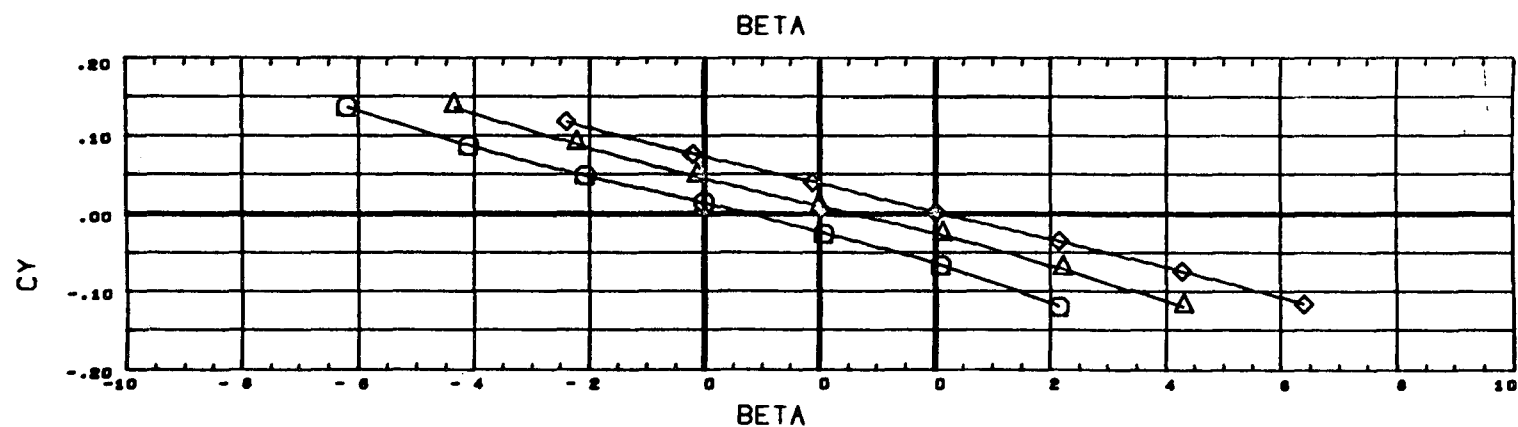
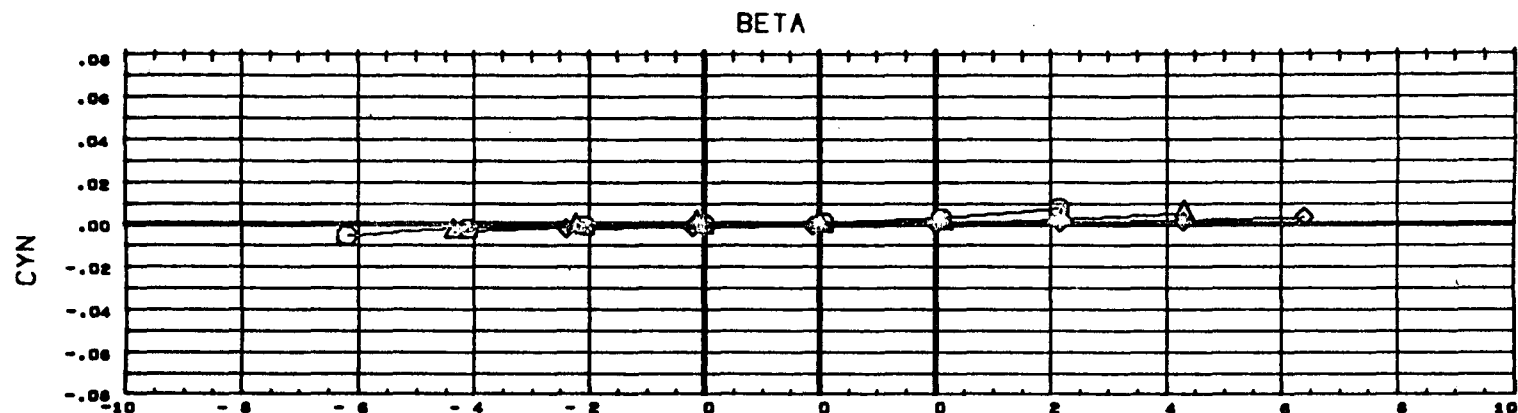
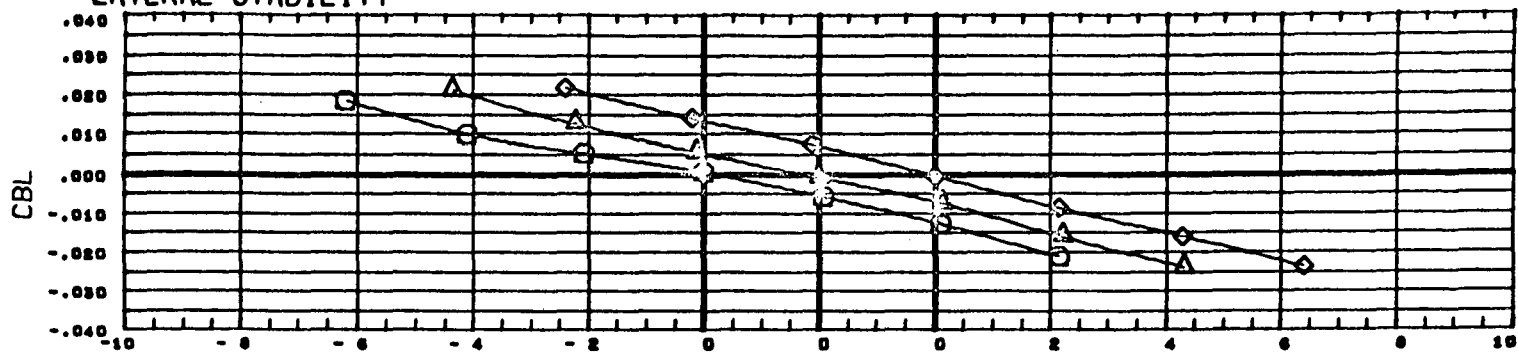
M513-MSFC MODELAR12161-2

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LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES	RUDDER
○	0.598	ALPHA 10.000	0.000
△	0.898	RUDDLR 30.000	
◇	1.198		

REFERENCE INFORMATION		
SREF	14.6836	88. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

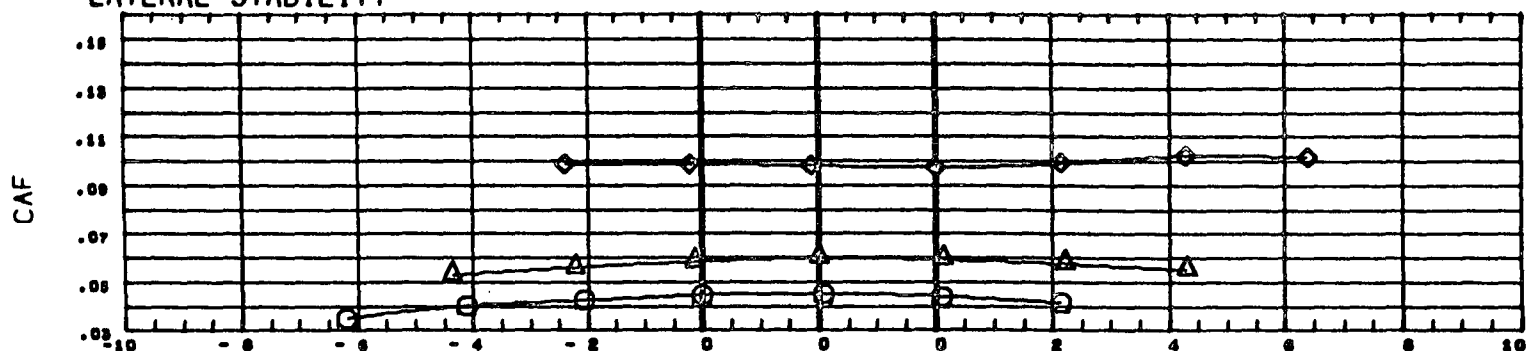
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B5CW11AF2S1V7

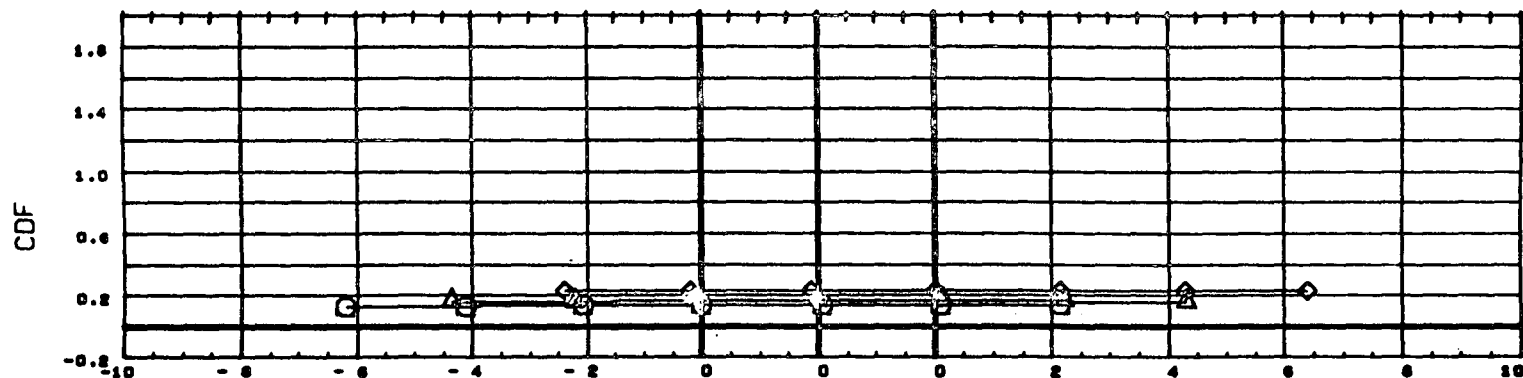
(C5305G) 18 MAR 72

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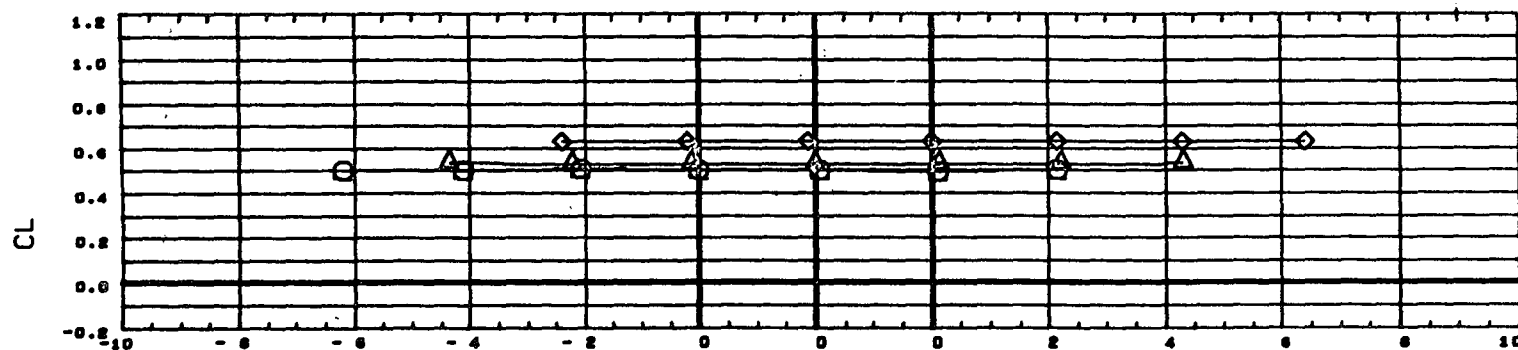
LATERAL STABILITY



BETA



BETA



BETA

SYMBOL	MACH	PARAMETRIC VALUES
○	0.998	ALPHA 10.000 RUDDER 0.000
△	0.998	RUDFLR 30.000
◇	1.198	

REFERENCE INFORMATION		
SREF	14.6836	88. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

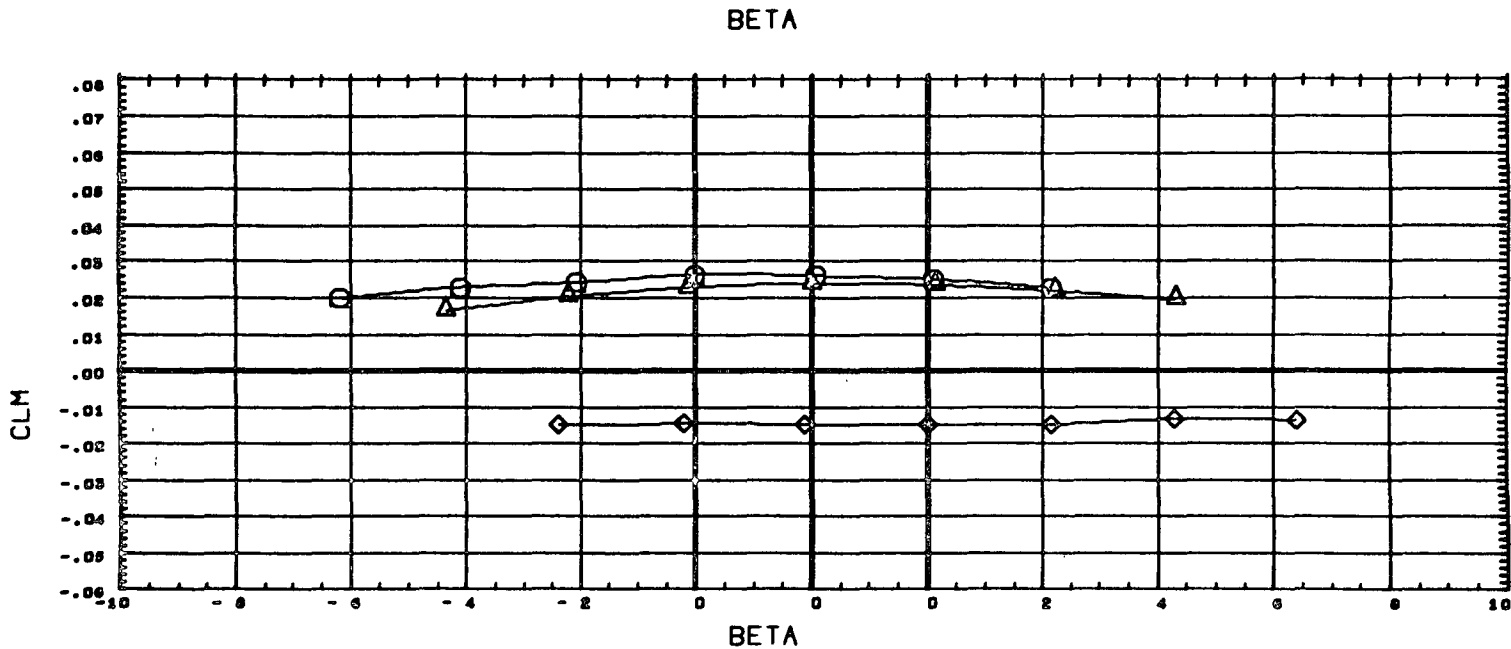
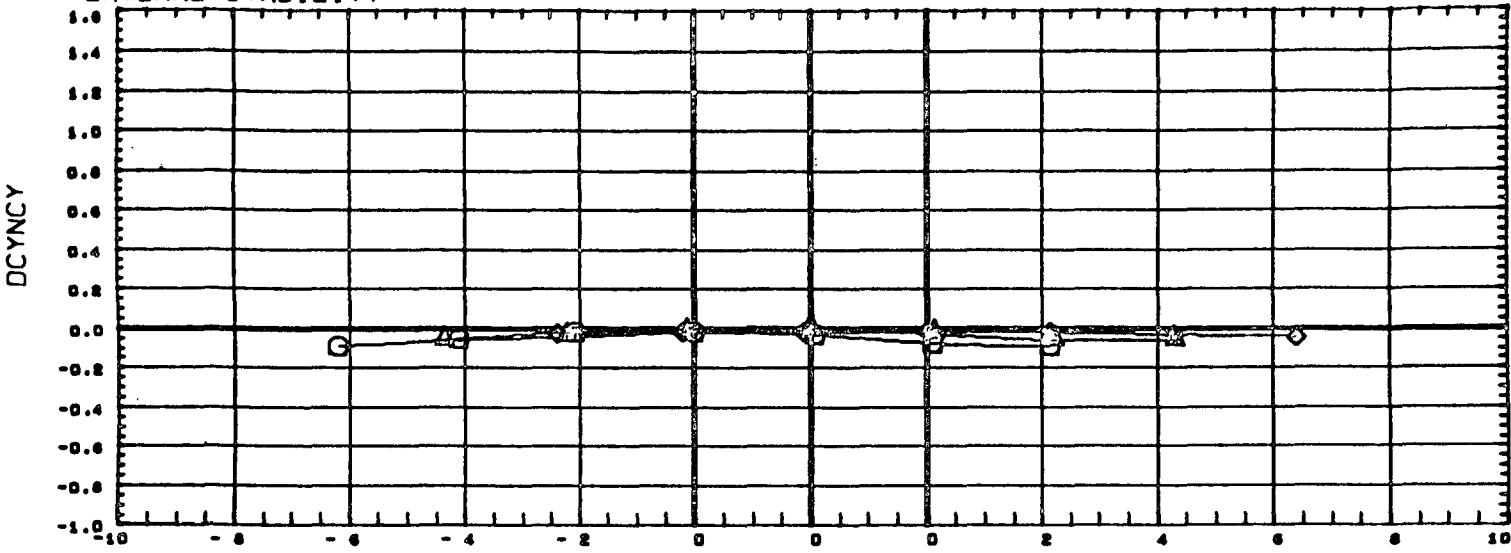
M513-MSFC MODELAR12161-2

B5CW11AF2S1V7

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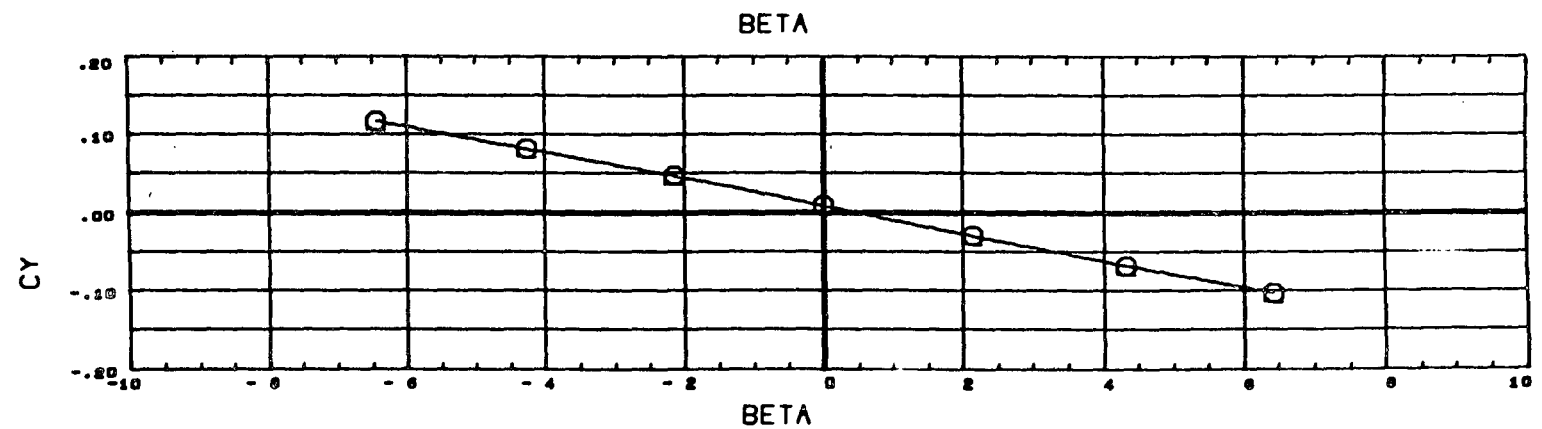
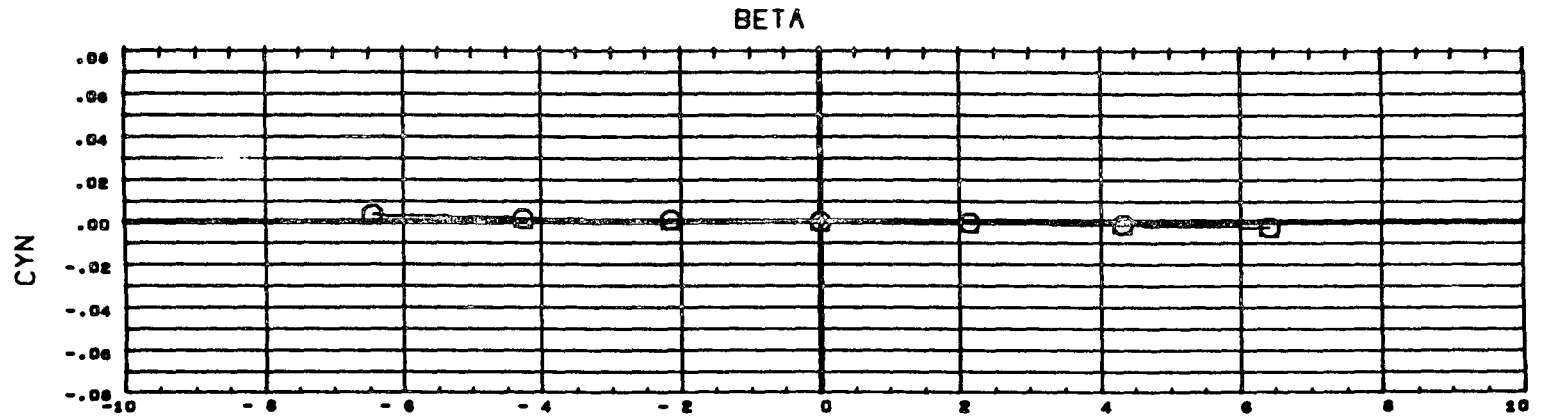
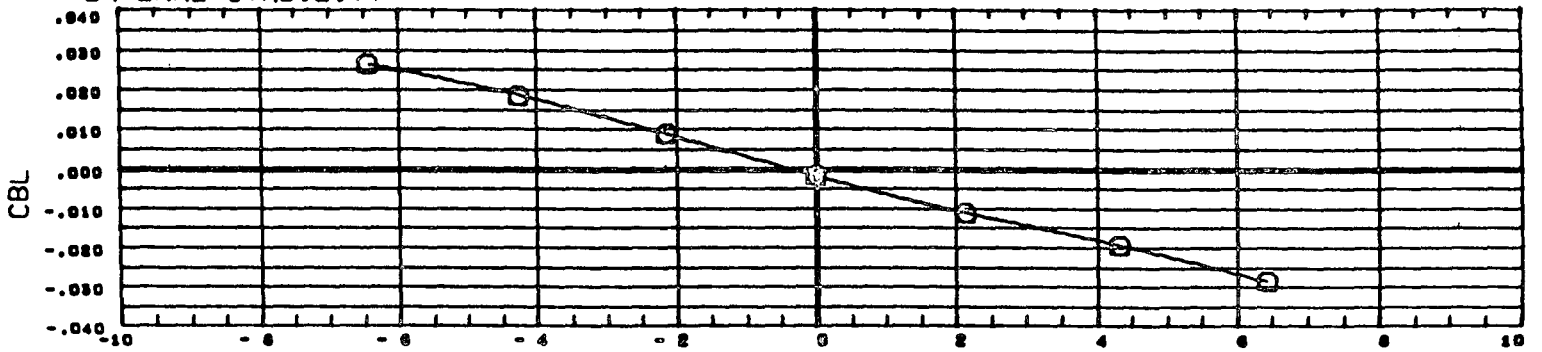
LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			REFERENCE INFORMATION		
○	0.590	ALPHA	10.000	RUDDER	0.000	SREF	14.6836 98. IN.
△	0.696	RUDFLR	30.000			LREF	4.5080 IN.
◇	1.198					BREF	5.6590 IN.
						XMRP	1.4821 IN.
						YMRP	0.0000 IN.
						ZMRP	0.0000 IN.
						SCALE	0.0034

DATA HIST. CODE 6C

LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	1.199	ALPHA	18.000	RUDDER	0.000
		RUDFLR	30.000		

REFERENCE INFORMATION		
SREF	14.8836	80. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE 6C

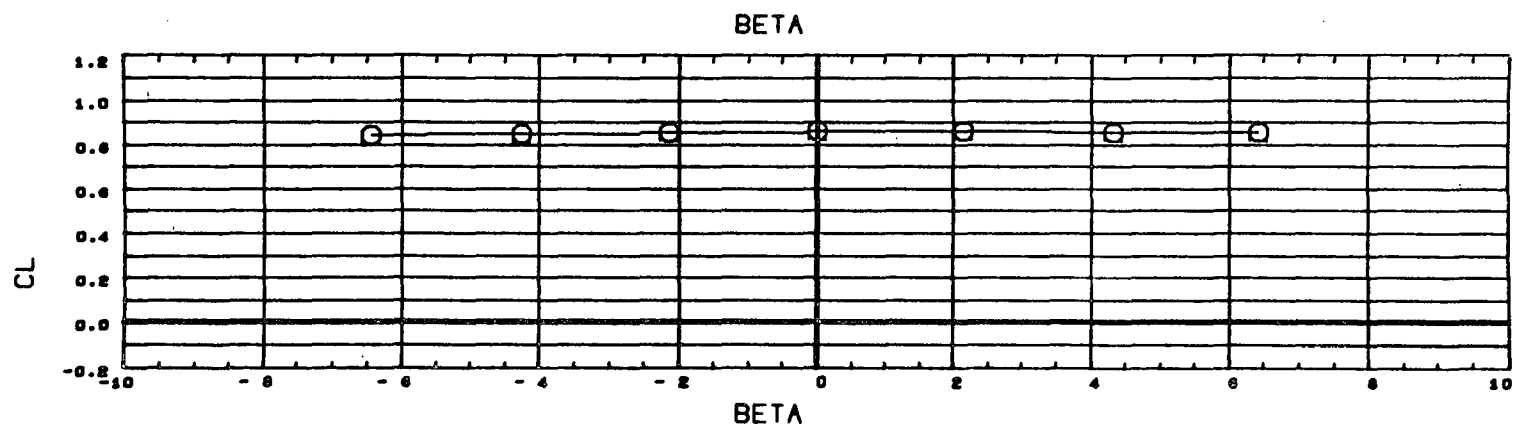
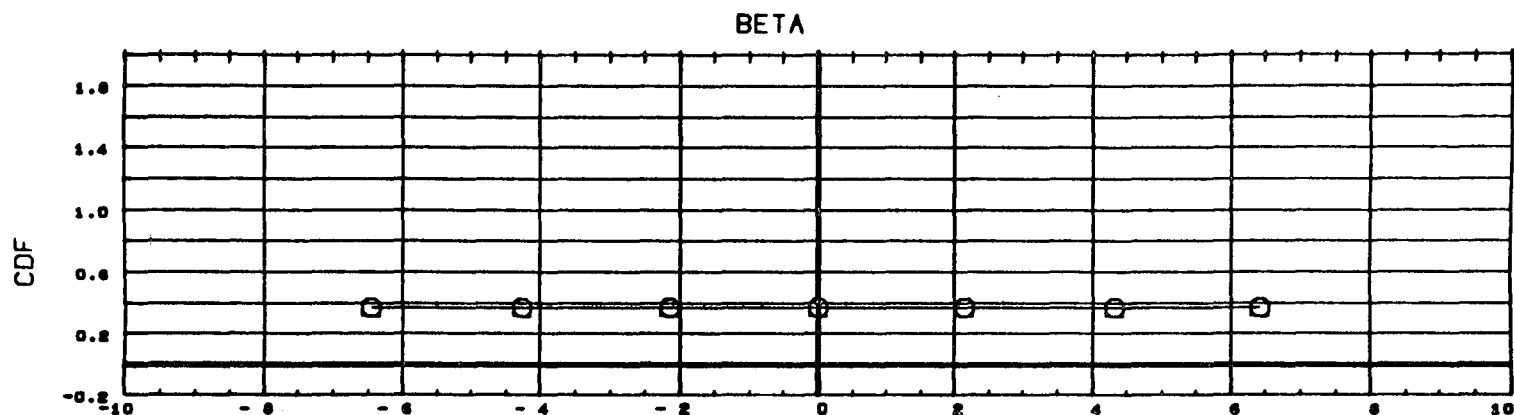
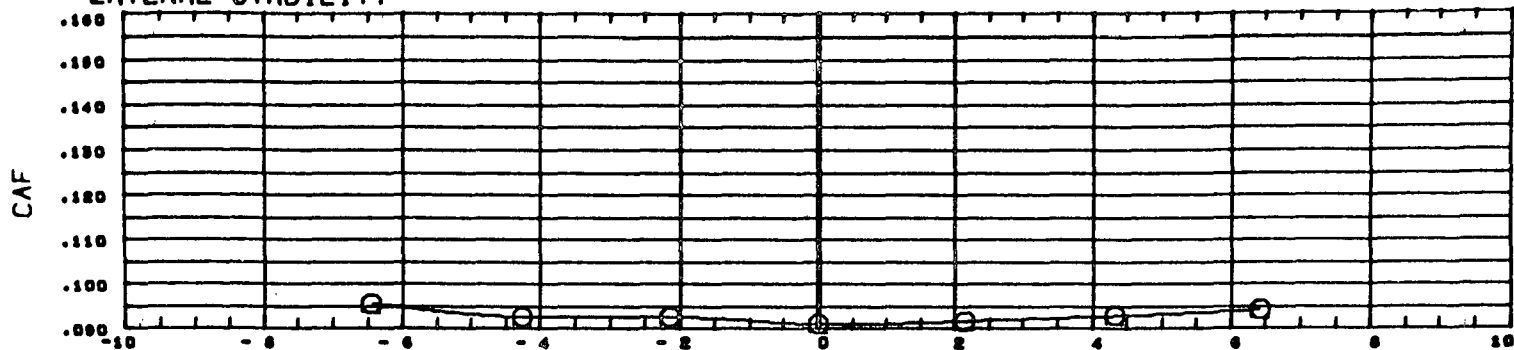
M513-MSFC MODELAR12161-2

B5CW11AF2S1V7

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LATERAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 O 1.100 ALPHA 15.000 RUDDER 0.000
 RUDDLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 SQ. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XHRP 1.4821 IN.
 YHRP 0.0000 IN.
 ZHRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

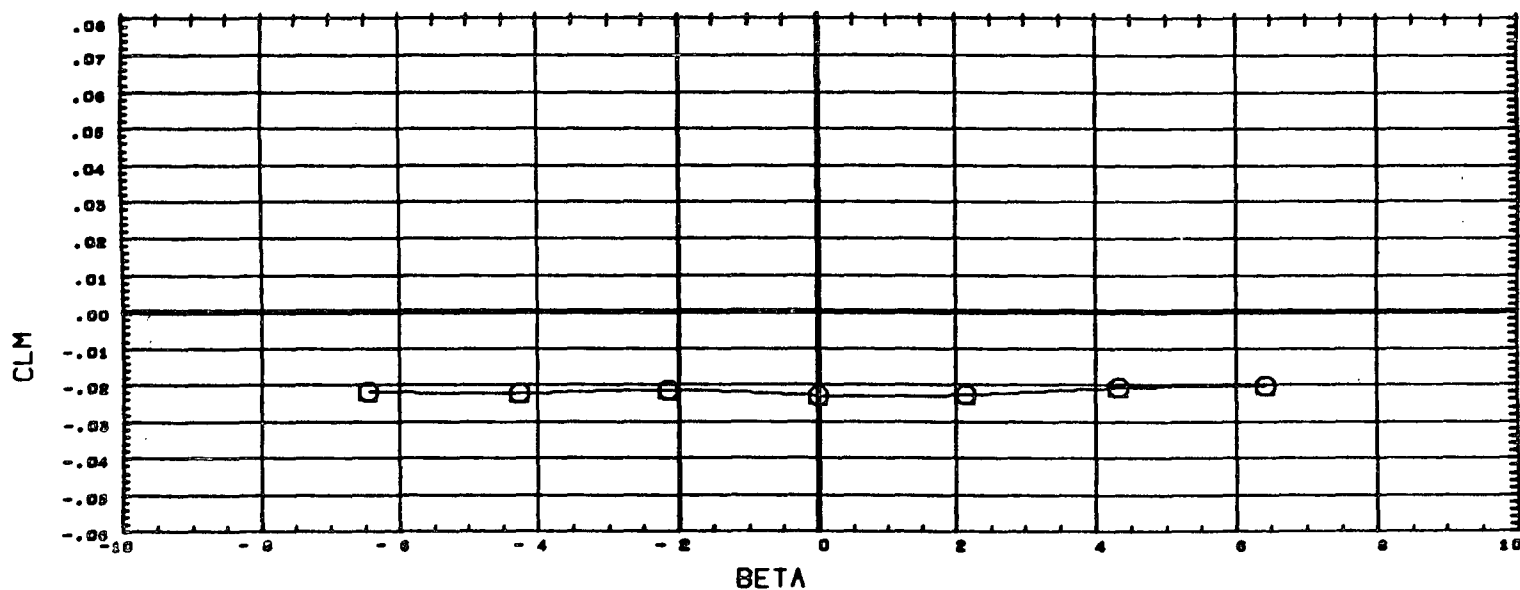
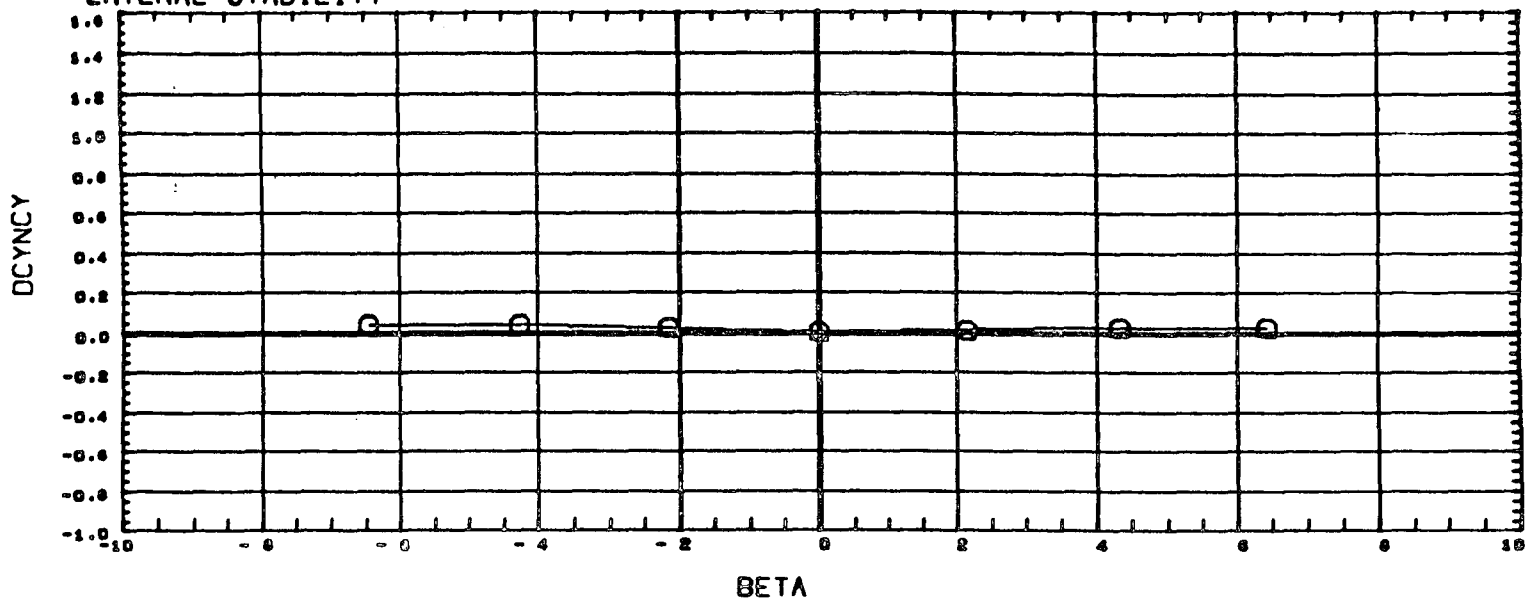
M513-MSFC MODELAR1216I-2

B5CW11AF2S1V7

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LATERAL STABILITY



SYMBOL \square MACH 1.199
 PARAMETRIC VALUES
 ALPHA 15.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6036 SQ. IN.
 LREF 4.9080 IN.
 BREF 5.6550 IN.
 XMRP 1.4021 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

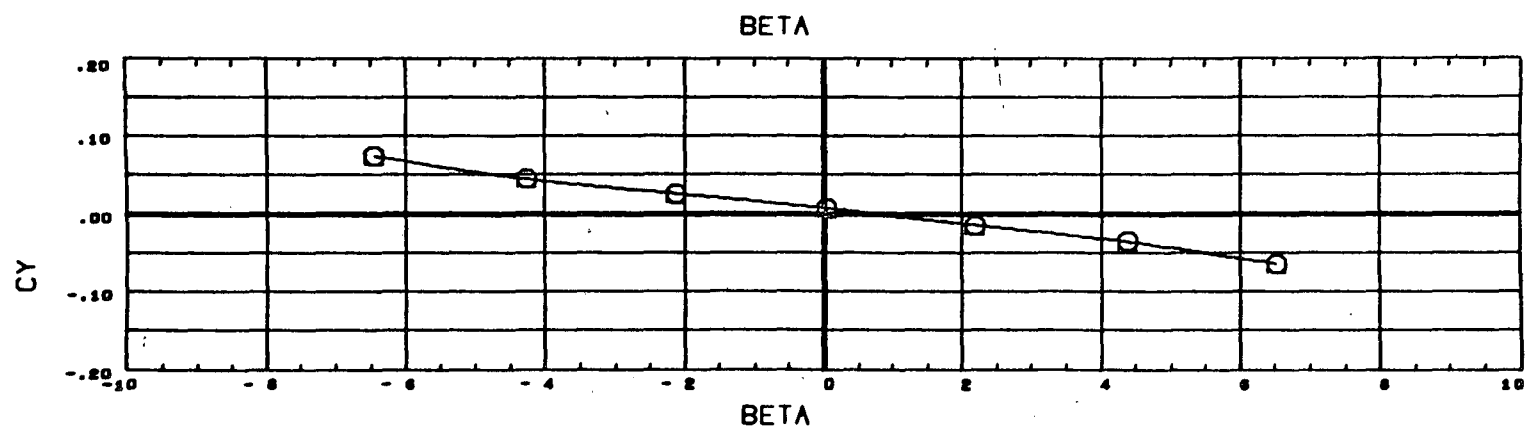
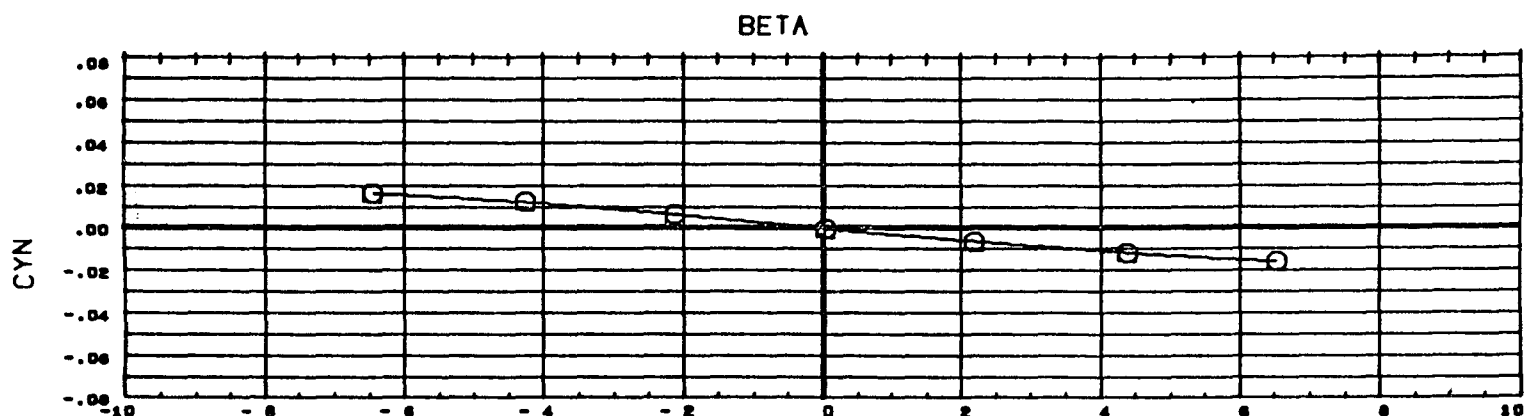
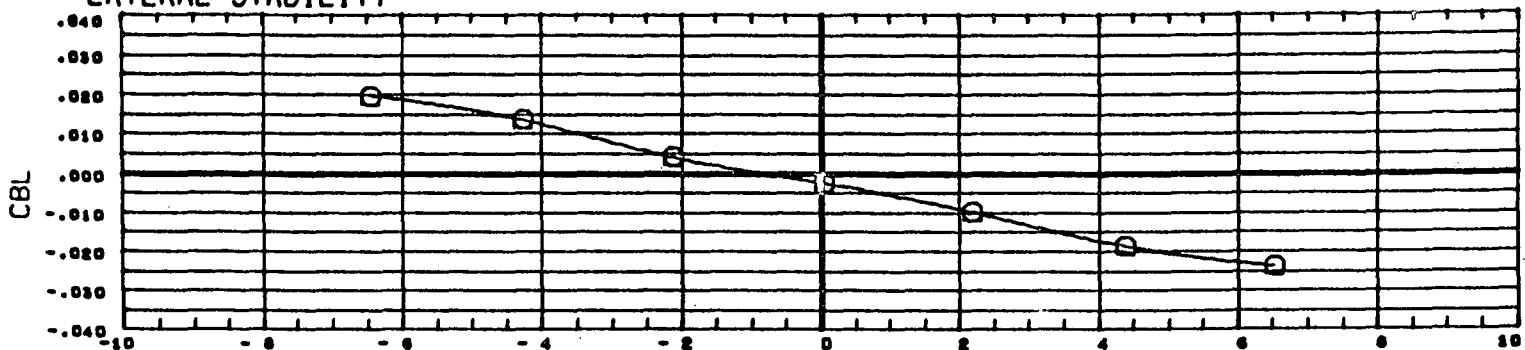
DATA HIST. CODE 6C

M513-MSFC MODELAR1216I-2

B5CW11AF2S1V7

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LATERAL STABILITY



SYMBOL \bigcirc MACH 1.970
 ALPHA 25.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6636 88. IN.
 LREF 4.5080 IN.
 BREF 9.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE .6C

M513-MSFC MODELAR1216I-2

B5CW11AF2S1V7

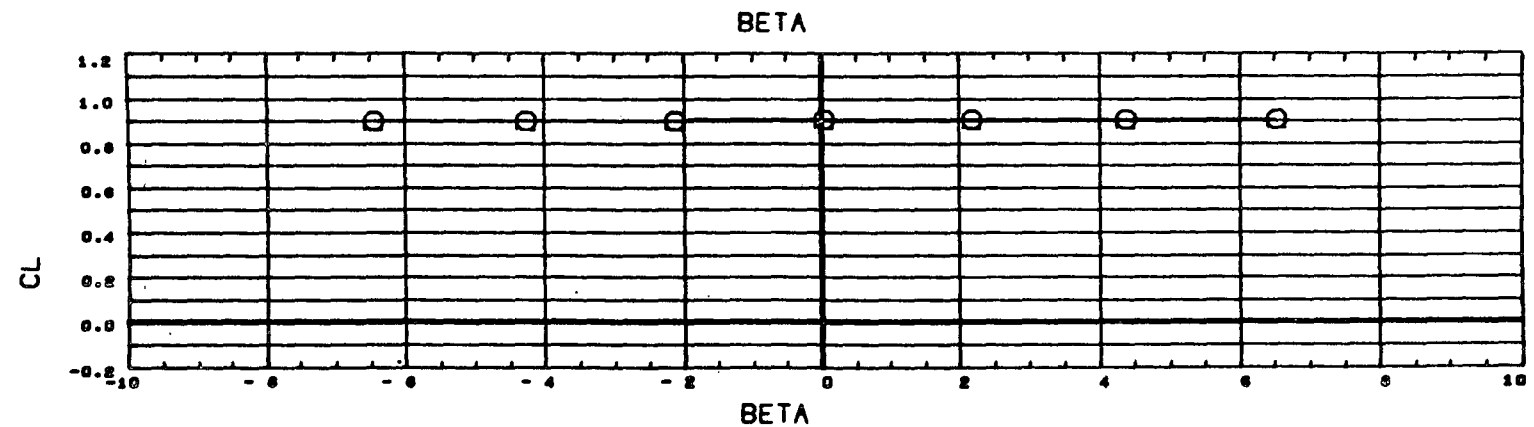
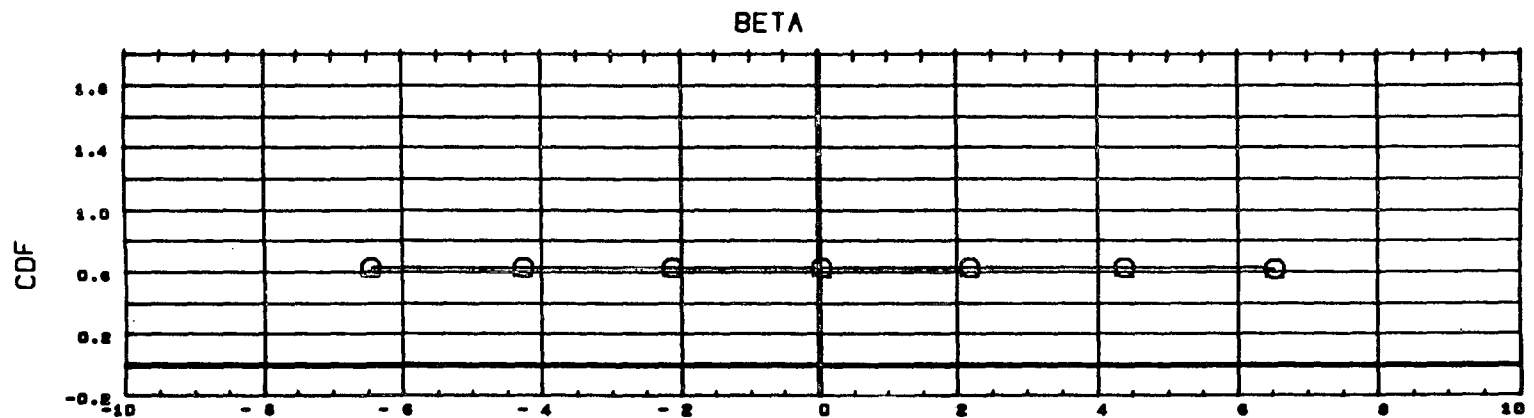
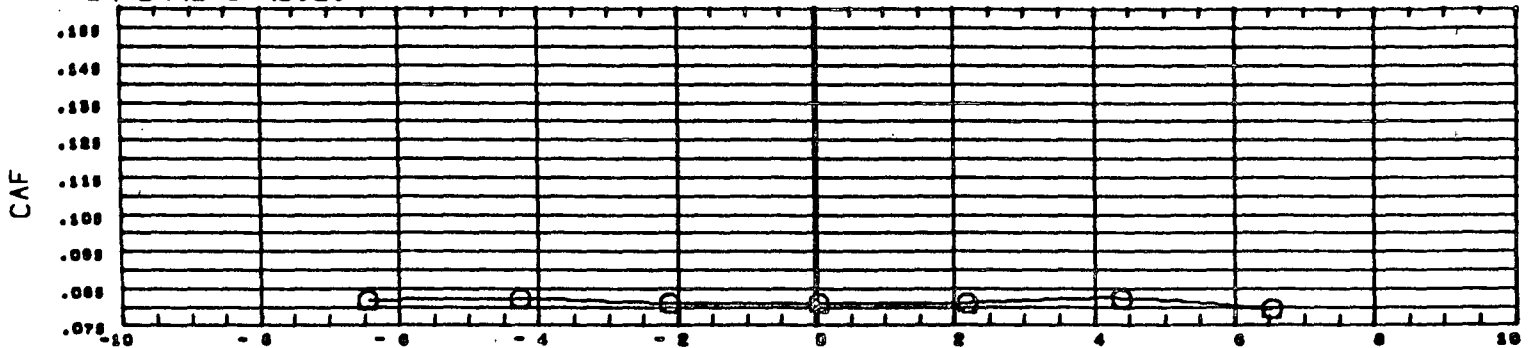
(C5305L)

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LATERAL STABILITY



SYMBOL ☐ MACH 1.979 ALPHA 25.000 RUDDER 0.000
 RUDFLR 50.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

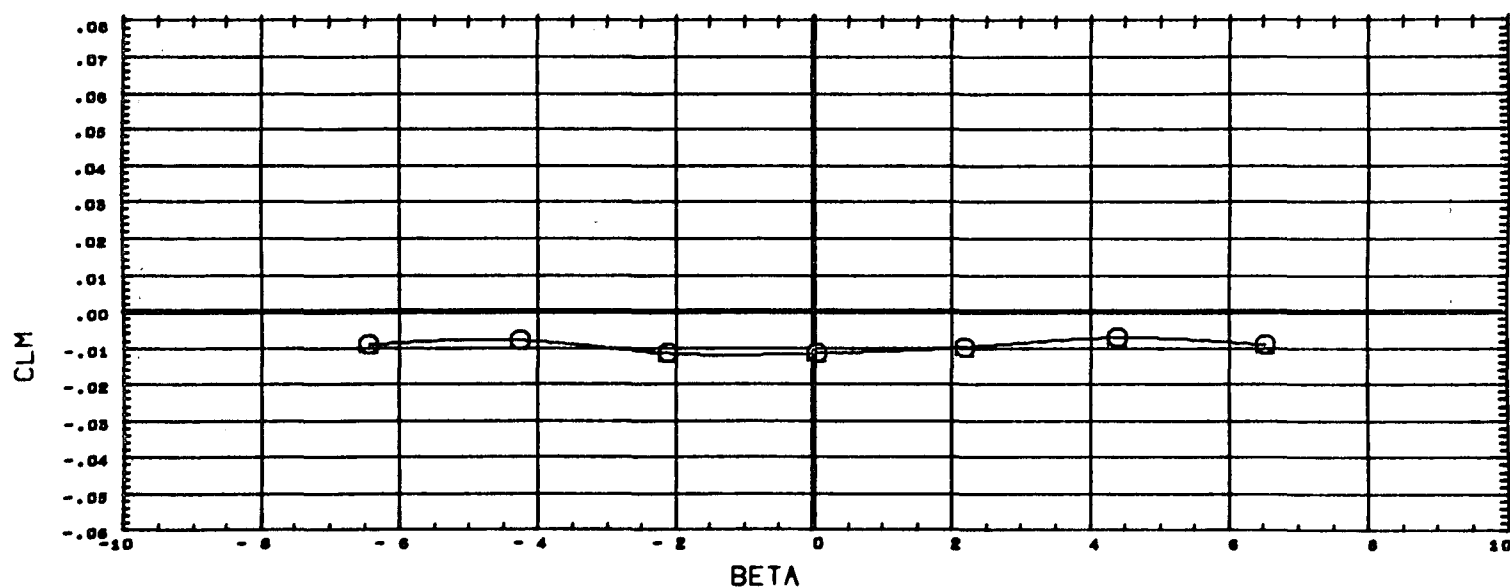
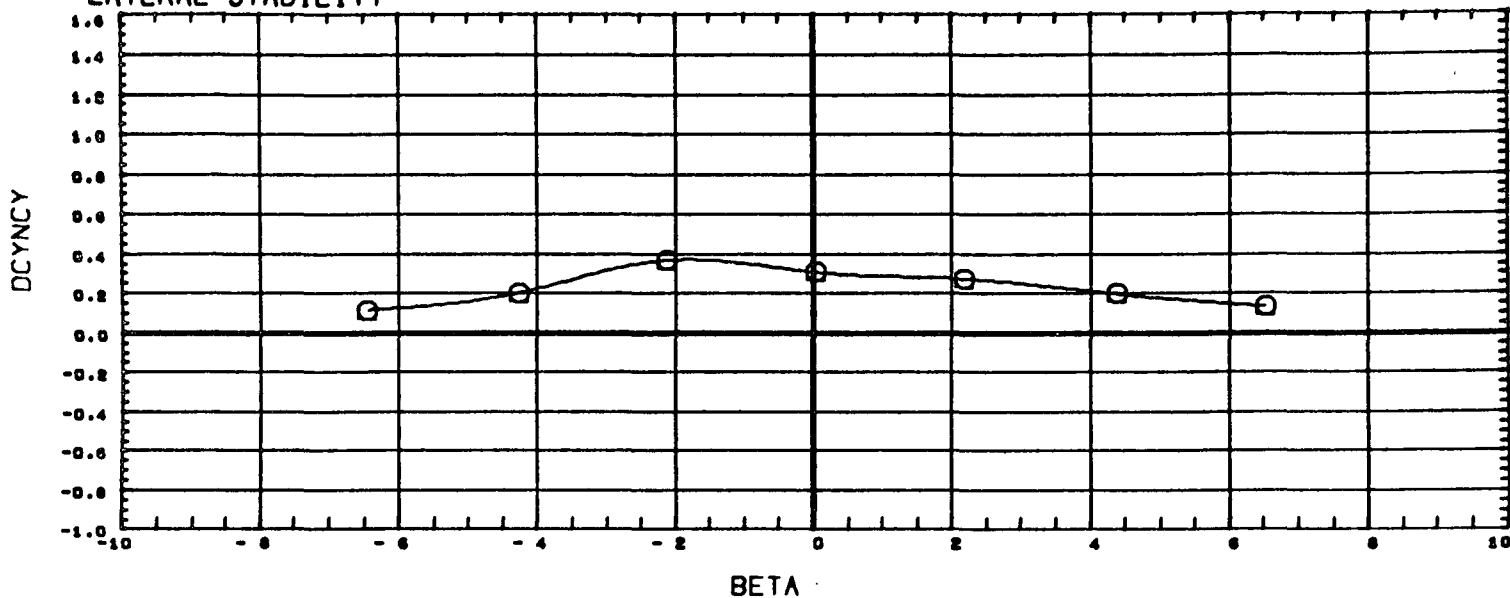
M513-MSFC MODELAR1216I-2

B5CW11AF2S1V7

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LATERAL STABILITY



SYMBOL \square MACH 1.979
 PARAMETRIC VALUES
 ALPHA 25.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6636 80. IN.
 LREF 4.5060 IN.
 BREF 9.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

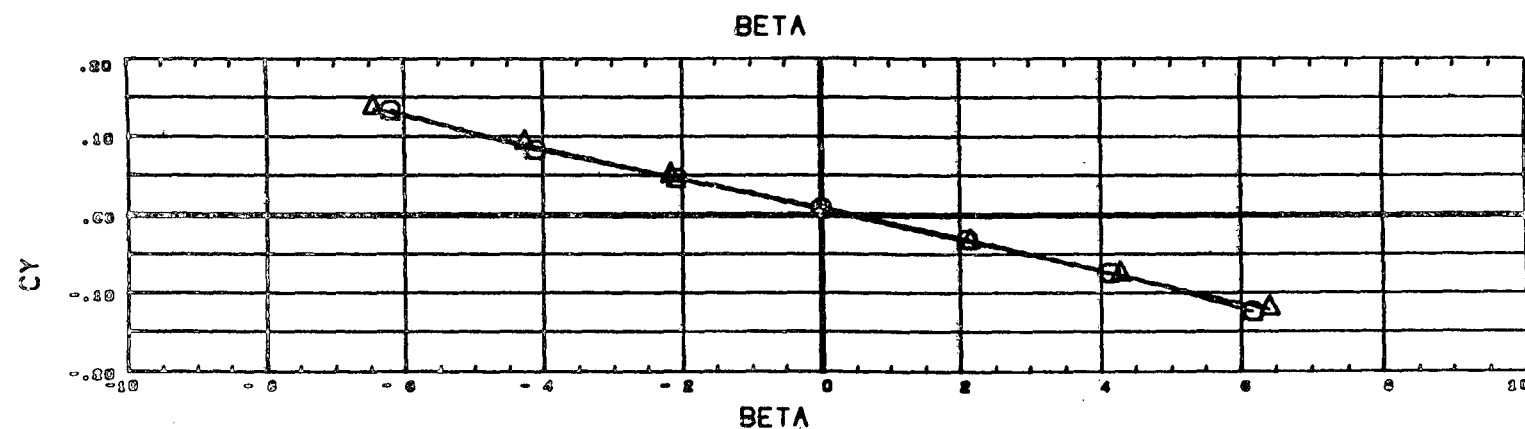
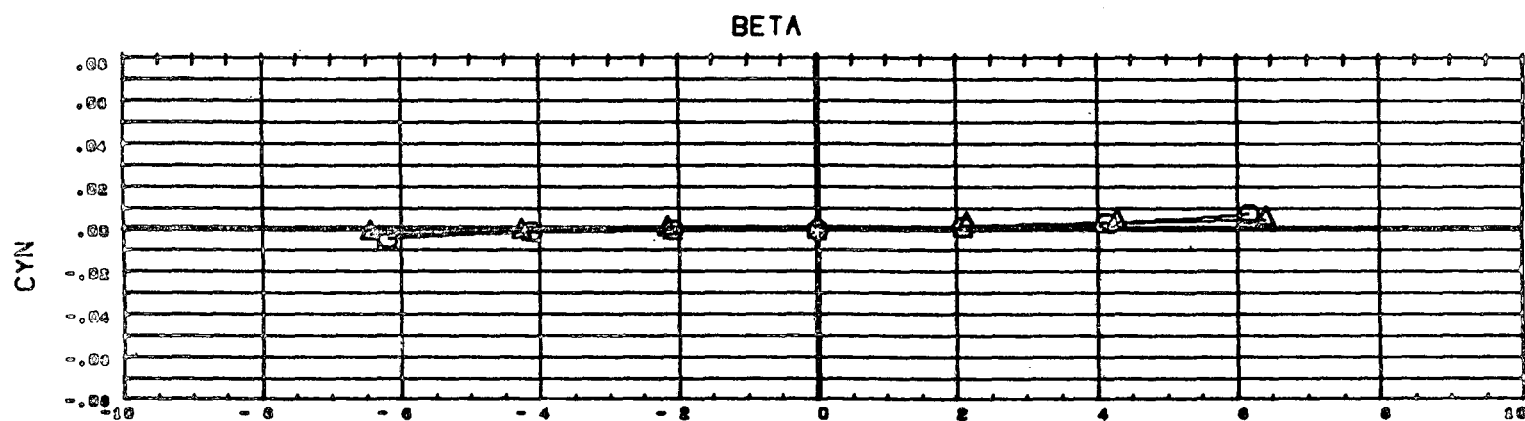
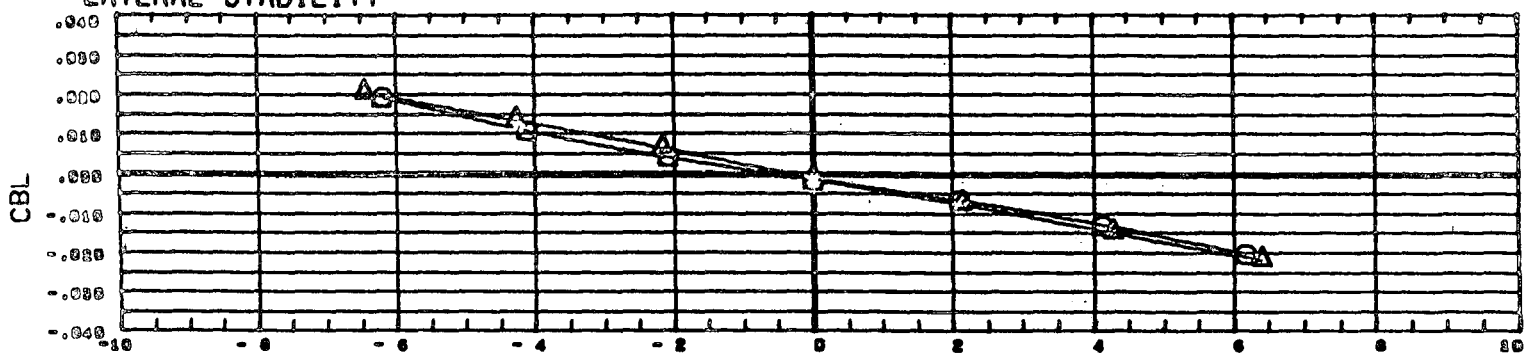
M513-MSFC MODELAR12161-2

B5CW11AF2S1V7

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LATERAL STABILITY



SYMBOL	NACH	PARAMETRIC VALUES			
○	0.990	ALPHA	10.000	RUDDER	0.000
△	1.100	RUDFLR	30.000		

REFERENCE INFORMATION		
SREF	14.6836	66. IN.
LREF	4.9090	IN.
BREF	8.6550	IN.
XMRP	1.4021	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA MISTY. CODE 6C

M513-MSFC MODELAR1216I-2

B5CW11AF2S1V7E2

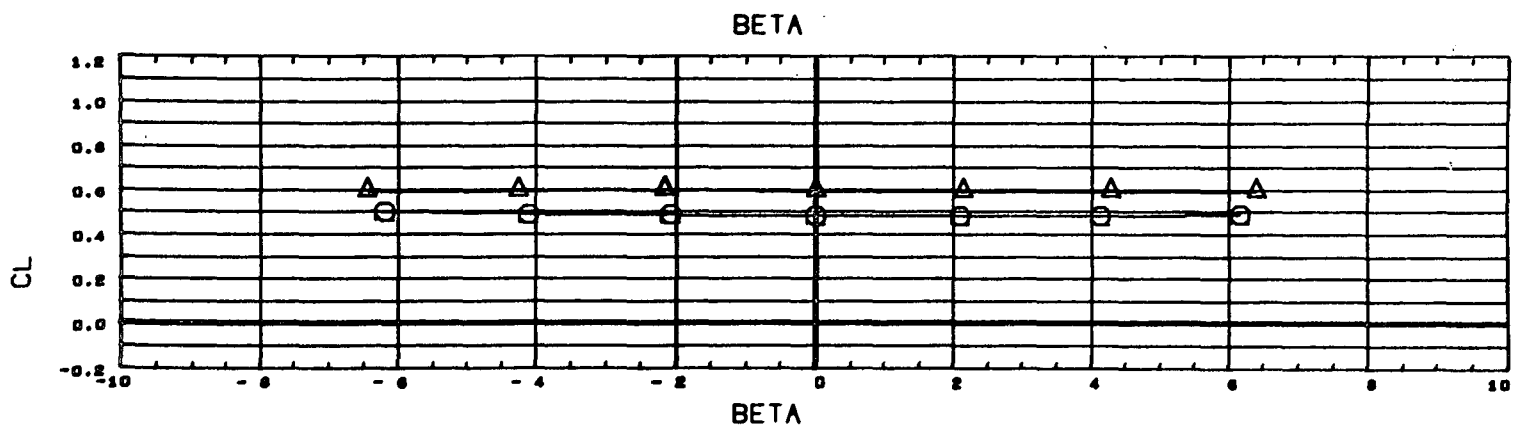
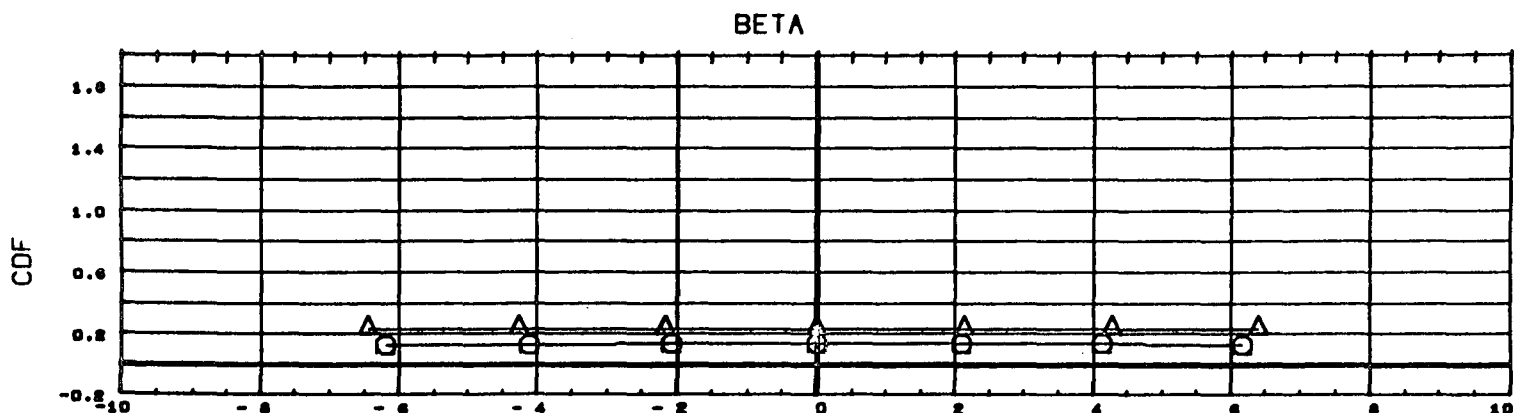
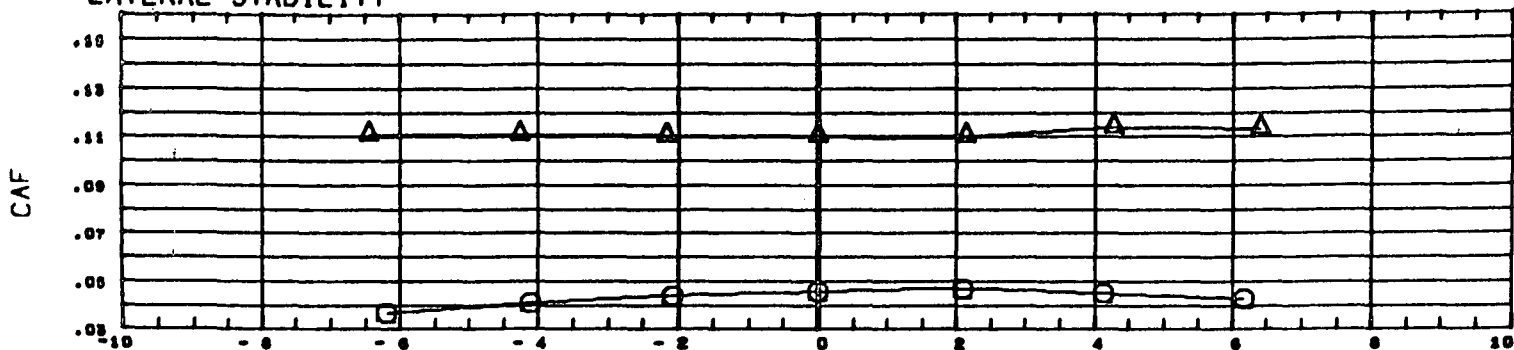
(C5306G)

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LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	0.596	ALPHA	10.000	RUDDER	0.000
△	1.196	RUDFLR	30.000		

REFERENCE INFORMATION		
SRFP	14.6836	88. IN.
LRFP	4.5080	IN.
DRFP	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E2

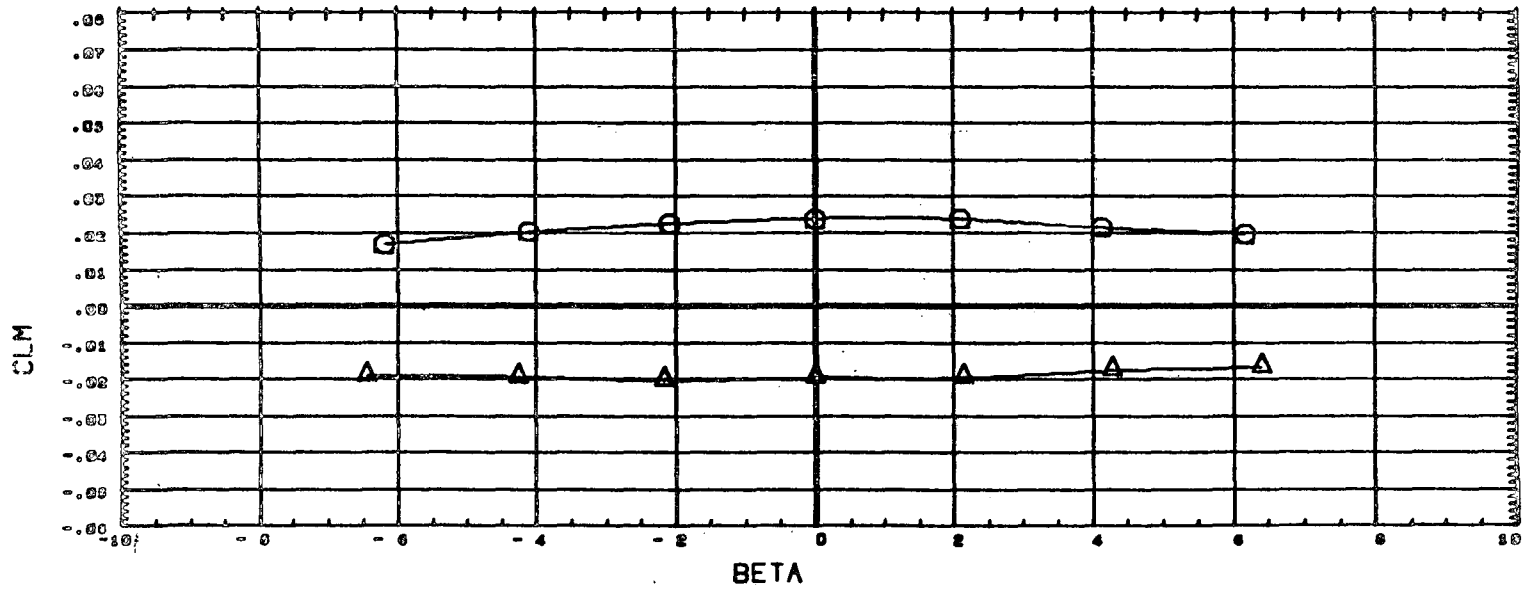
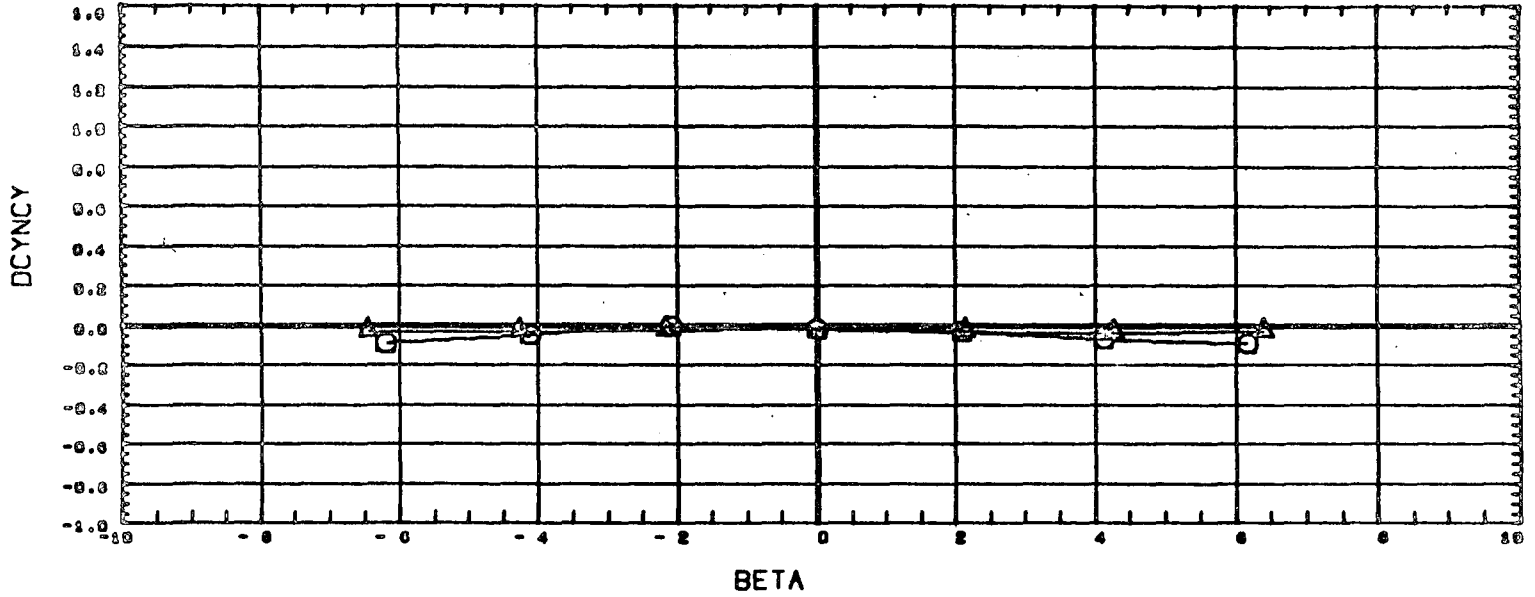
(C5306G)

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LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	0.800	ALPHA	10.000	RUDDER	0.000
△	1.100	RUDFLR	30.000		

REFERENCE INFORMATION		
SREF	14.6636	80. IN.
LREF	4.5080	IN.
BREF	9.6550	IN.
XMRP	1.4421	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE 6C

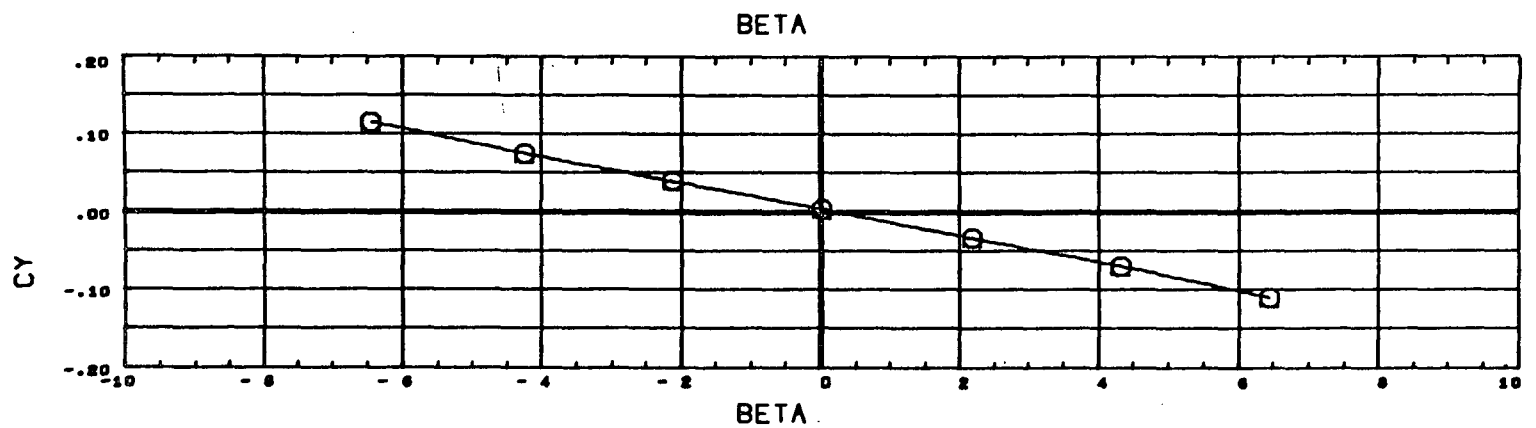
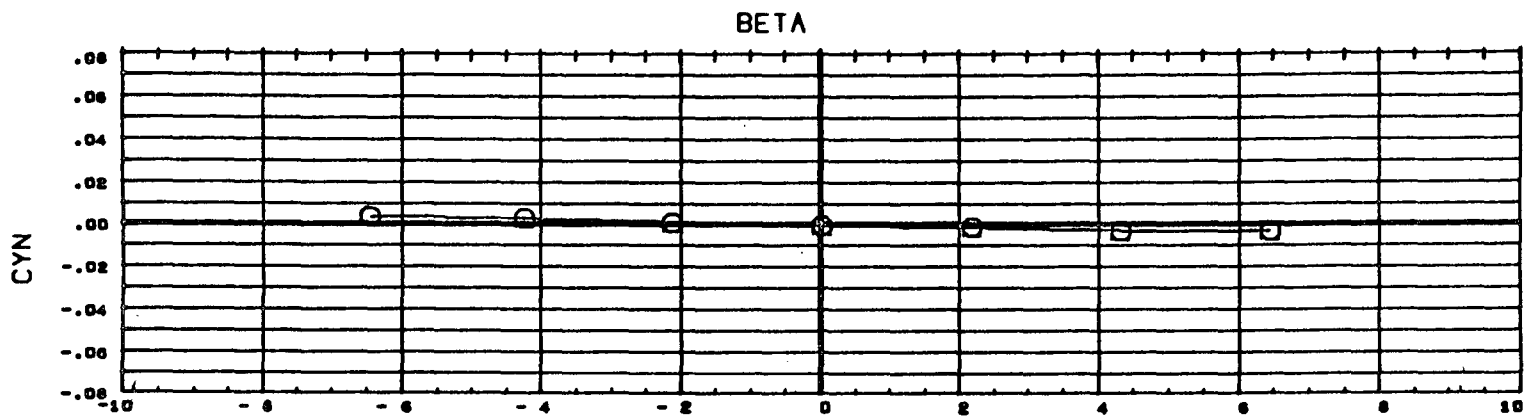
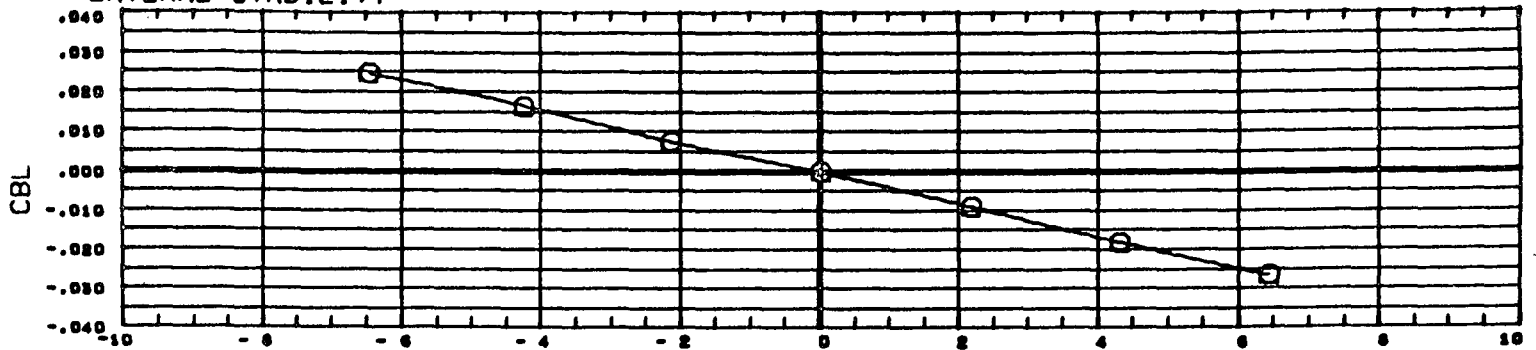
M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E2

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LATERAL STABILITY

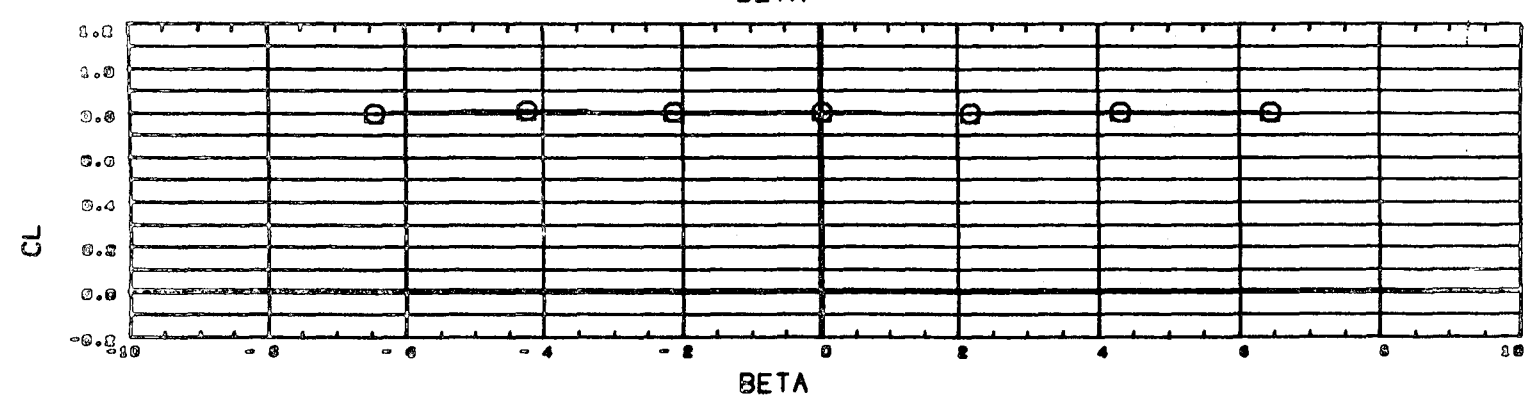
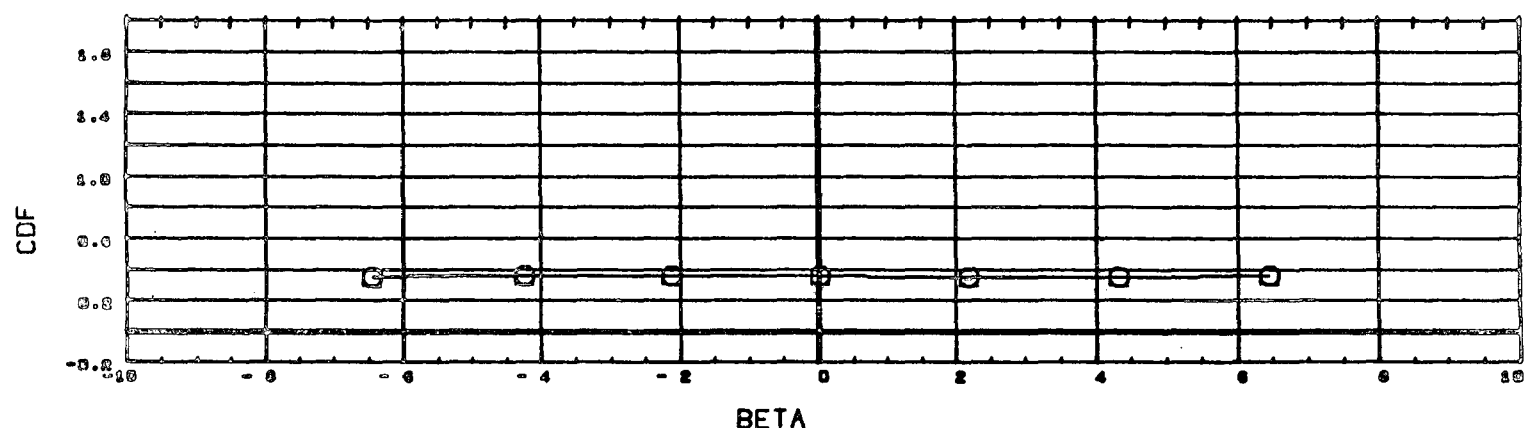
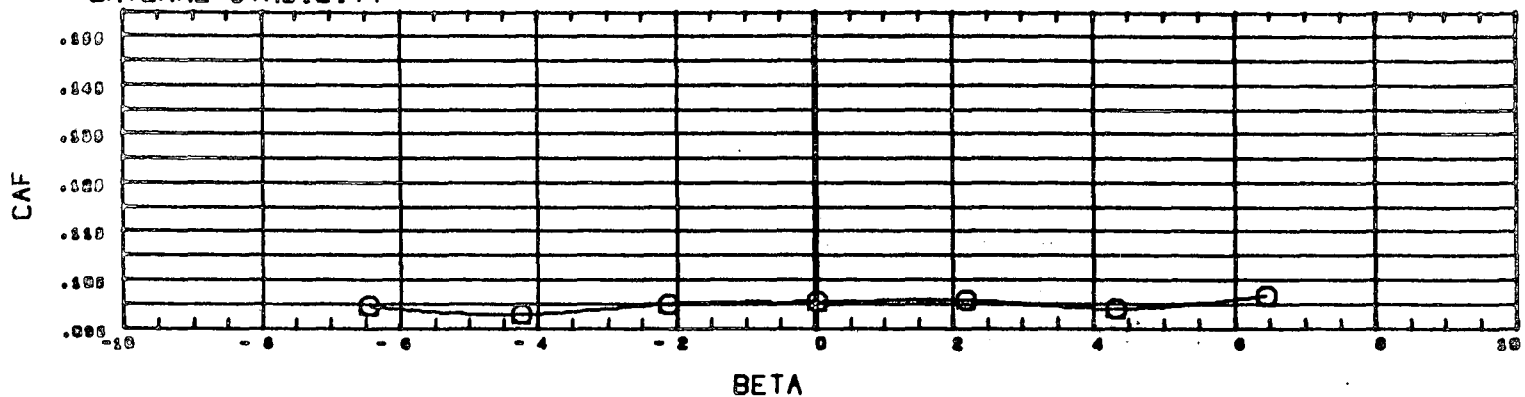


SYMBOL \square MACH 1.197
 PARAMETRIC VALUES
 ALPHA 15.000 RUDDER 0.000
 RUDFLR 30.000

DATA HIST. CODE GC

REFERENCE INFORMATION
 SREF 14.6836 88. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

LATERAL STABILITY



SYMBOL \square MACH 1.187 ALPHA 15.000 RUDDER 0.000
 RUDDLER 30.000

REFERENCE INFORMATION
 SREF 14.6836 00. IN.
 LREF 4.6000 IN.
 SREF 9.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 0C

M513-MSFC MODELAR1216I-2

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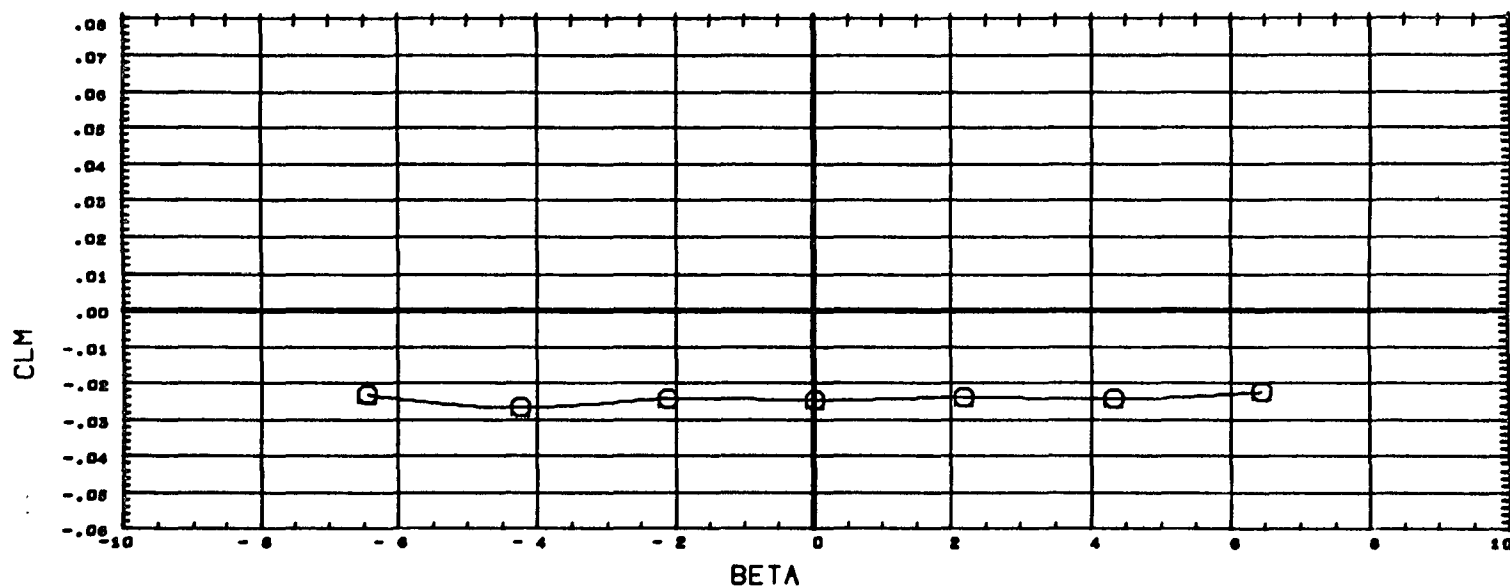
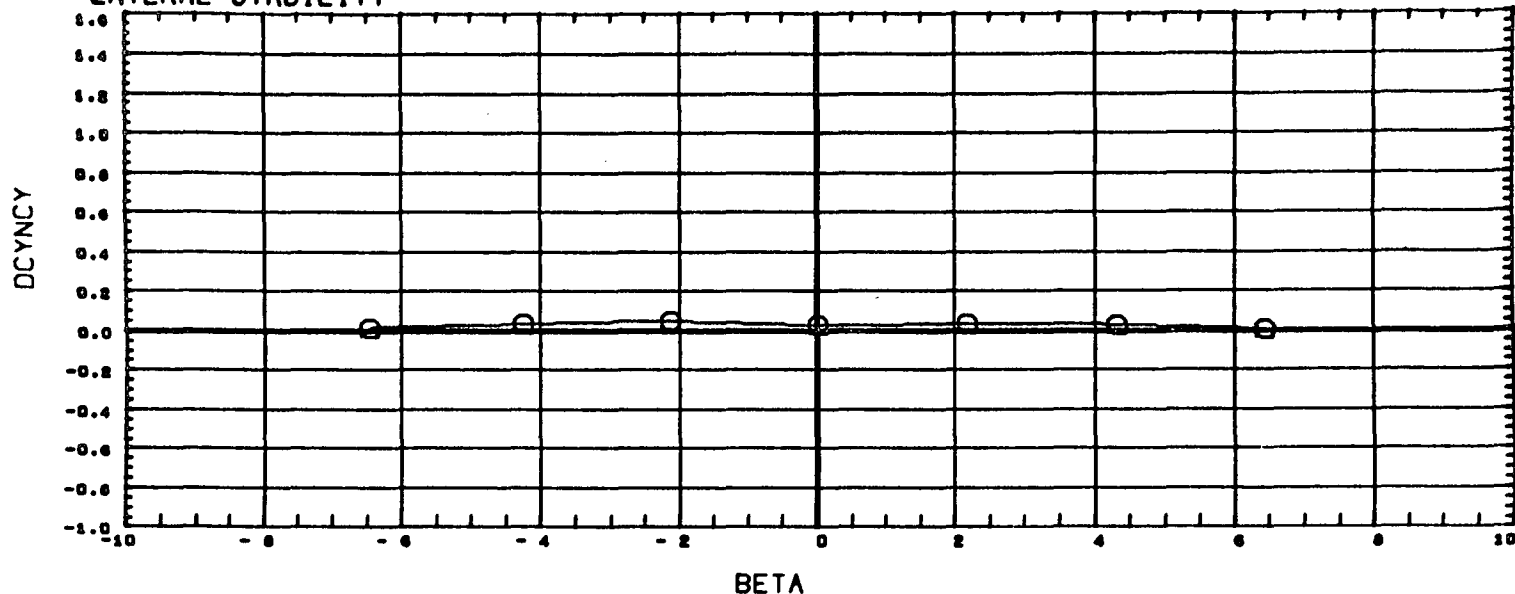
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LATERAL STABILITY



SYMBOL \square MACH 1.197 ALPHA 15.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6036 80. IN.
 LREF 4.5060 IN.
 BREF 9.6550 IN.
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 YHRP 0.0000 IN.
 ZHRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

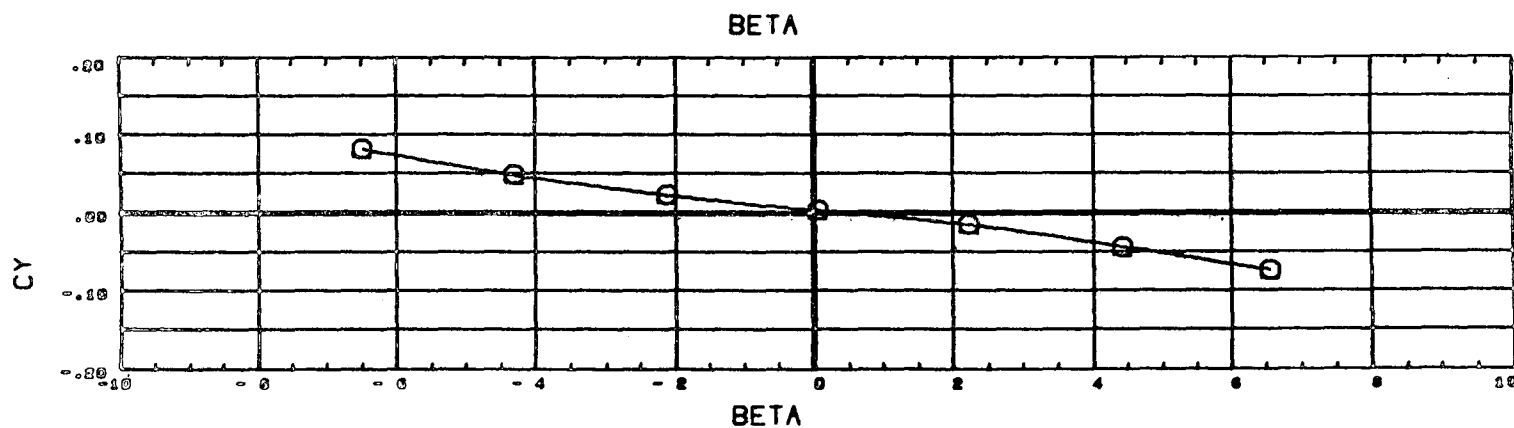
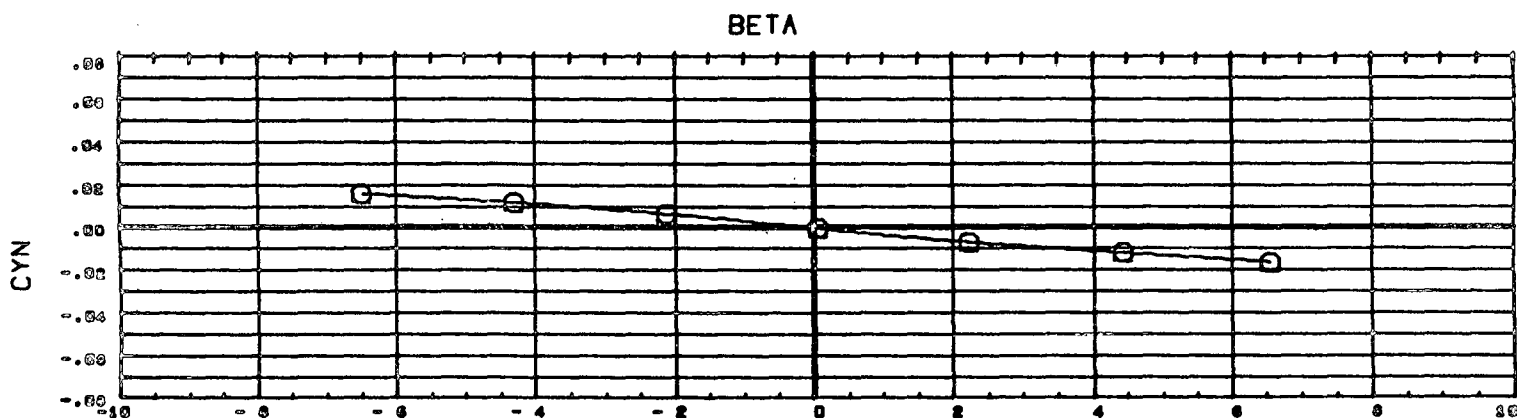
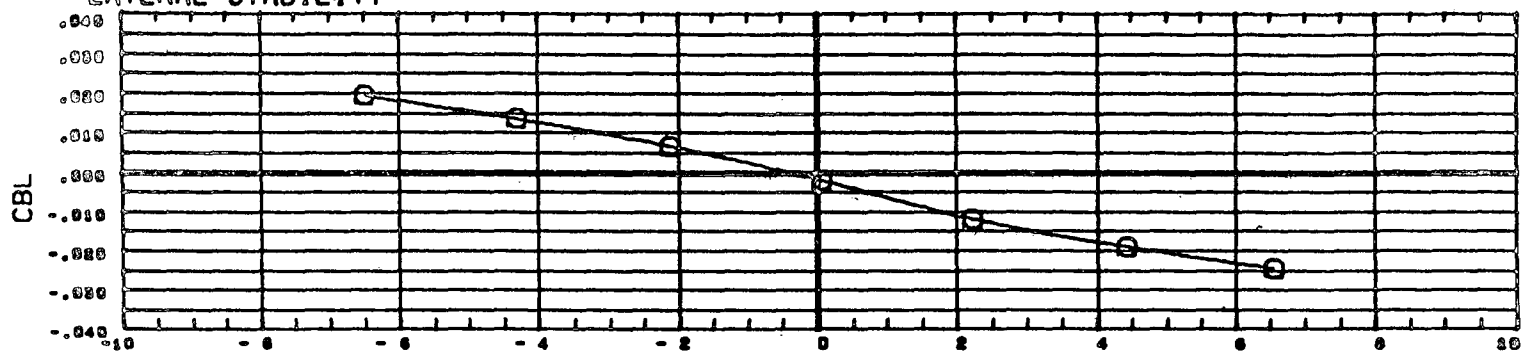
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B5CW11AF2S1V7E2

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LATERAL STABILITY



SYMBOL HACH PARAMETRIC VALUES
 □ 1.969 ALPHA 25.000 RUDDER 0.000
 RUDDLR 30.000

REFERENCE INFORMATION
 SREF 14.6636 36. IN.
 LREF 4.5060 IN.
 BREF 5.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

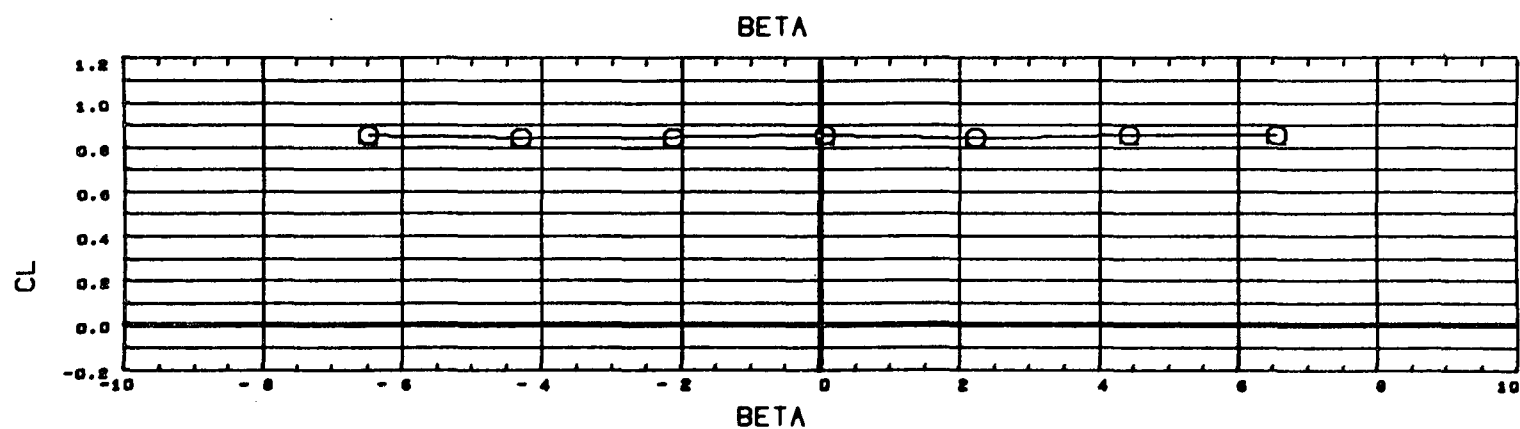
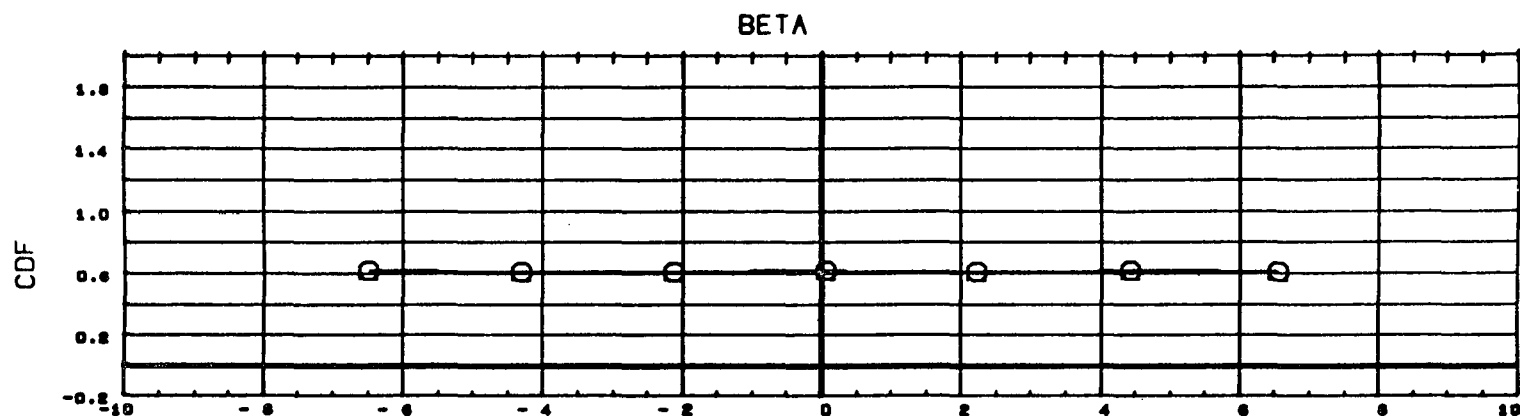
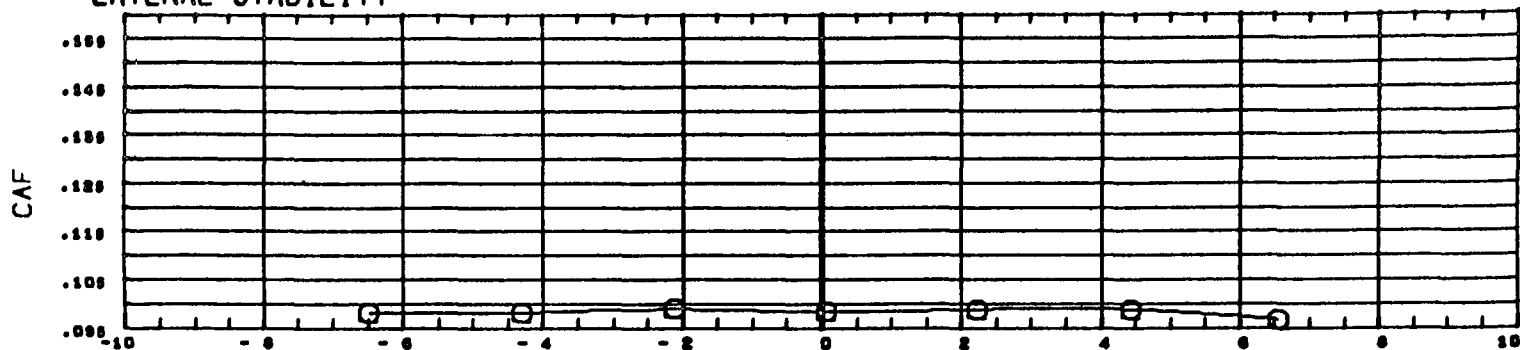
M513-MSFC MODELAR1216I-2

B5CW11AF2S1V7E2

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LATERAL STABILITY

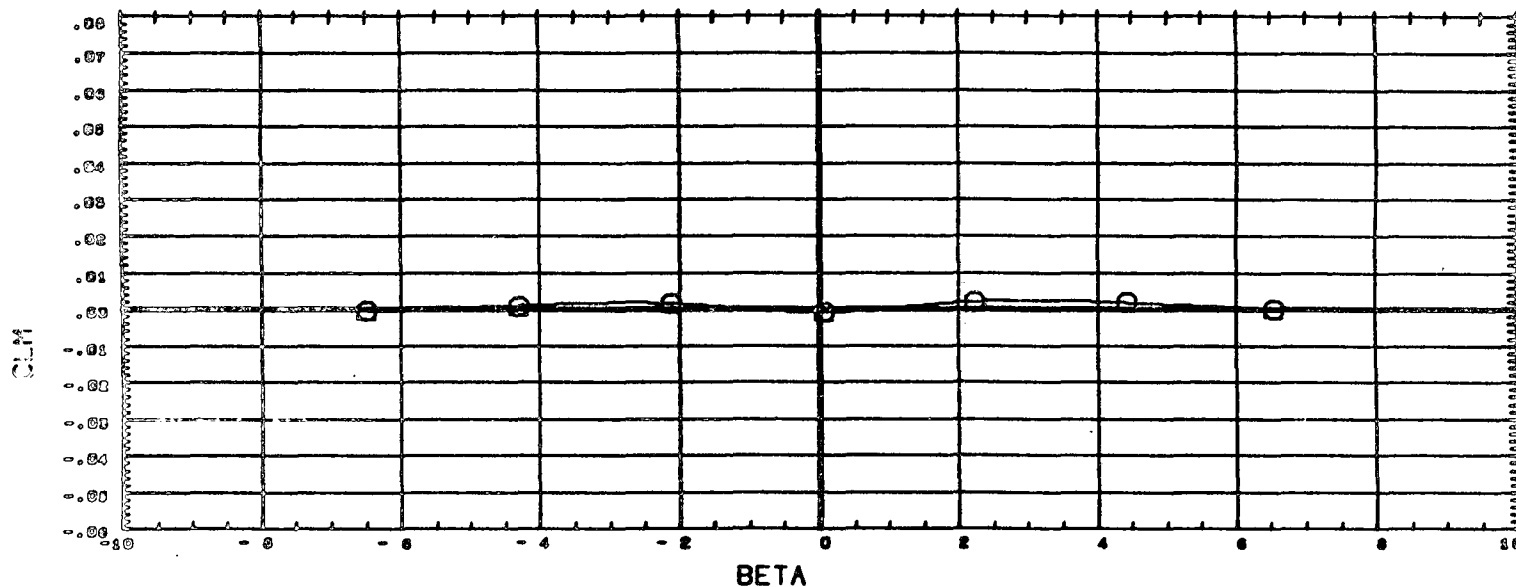
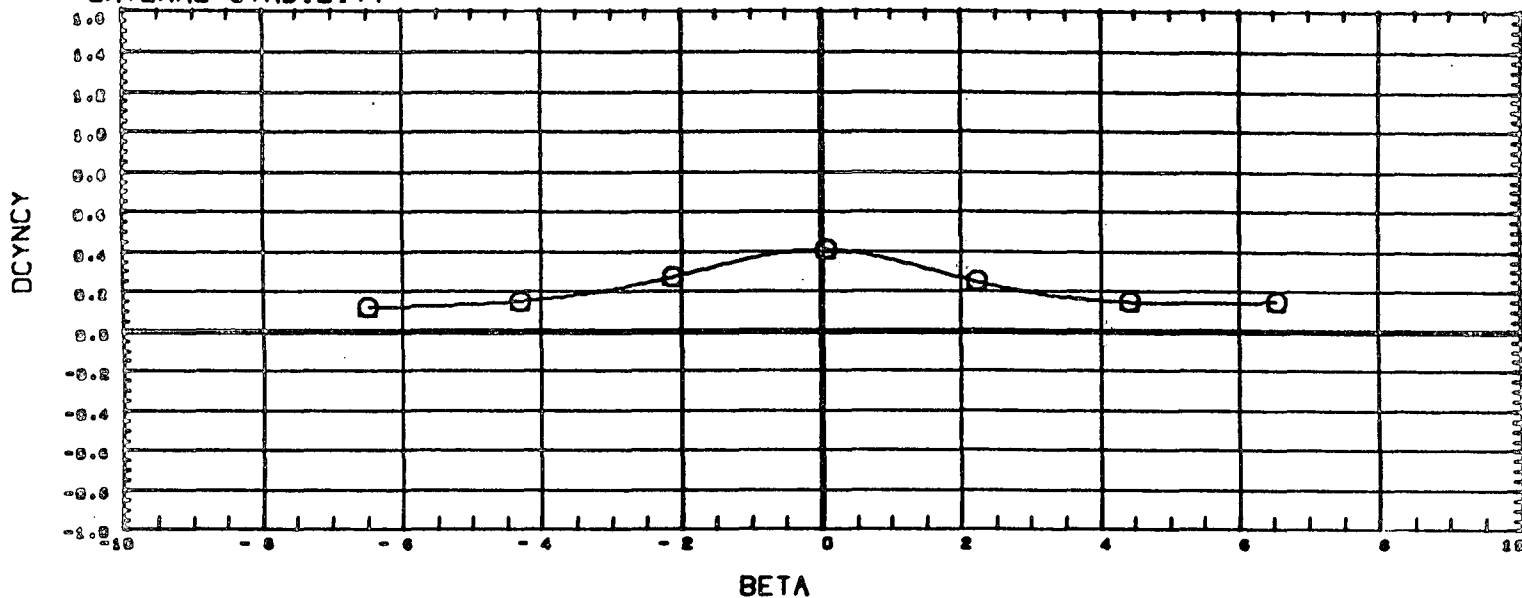


SYMBOL \square MACH 1.069
 PARAMETRIC VALUES
 ALPHA 25.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.9080 IN.
 BREF 3.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

LATERAL STABILITY



SYMBOL \bigcirc MACH 1.000
 ALPHA 25.000 RUDDER 0.000
 RUDDLK 30.000

DATA HIST. CODE 6C

REFERENCE INFORMATION
 SREF 14.0036 80. IN.
 LREF 4.9080 IN.
 BREF 5.6550 IN.
 XMRP 1.4021 IN.
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 ZMRP 0.0000 IN.
 SCALE 0.0034

M513-MSFC MODELAR12161-2

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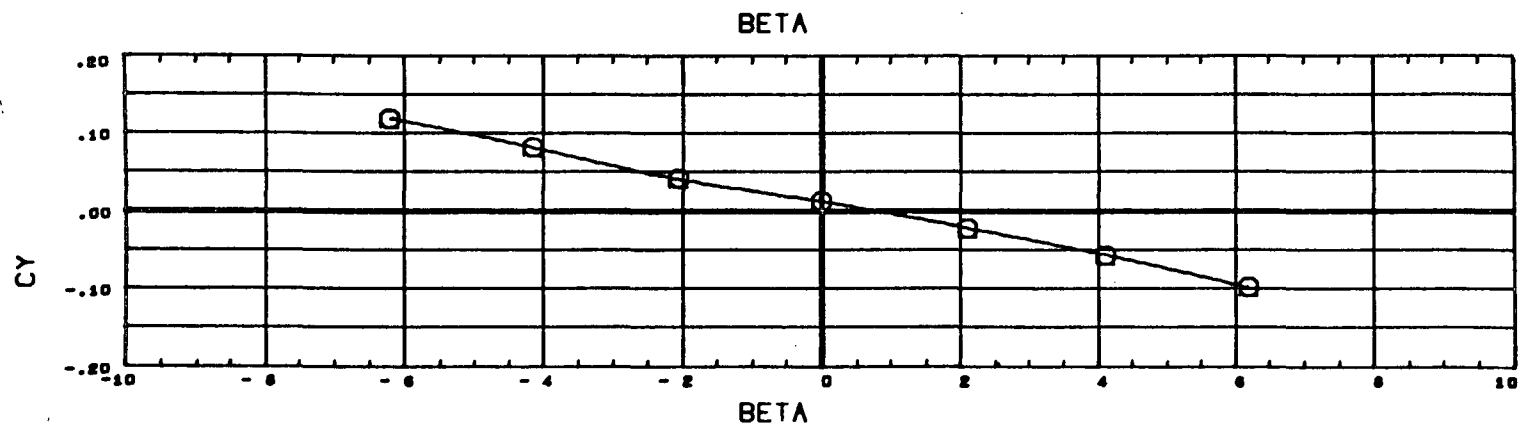
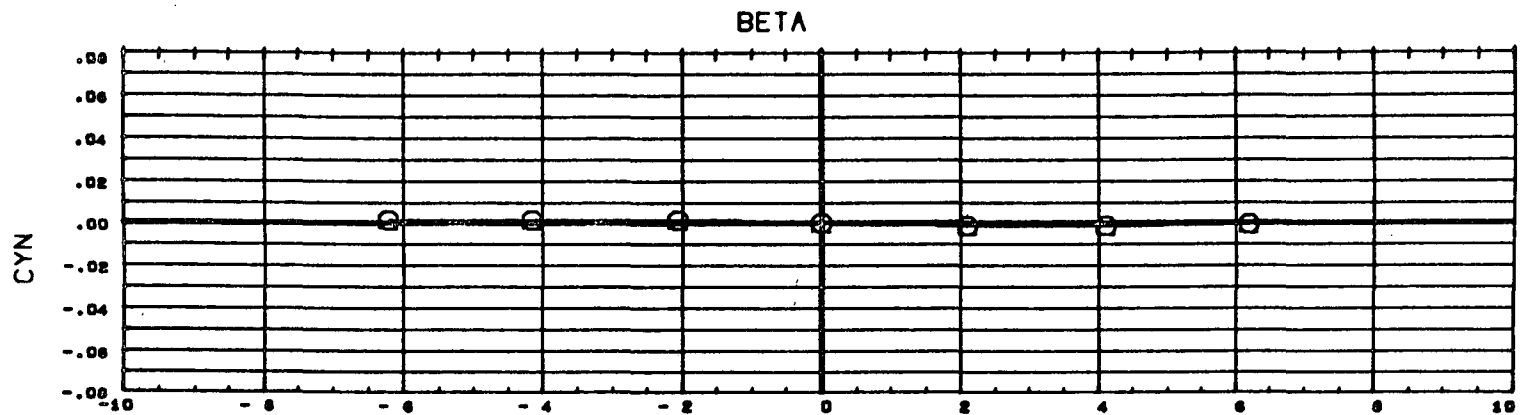
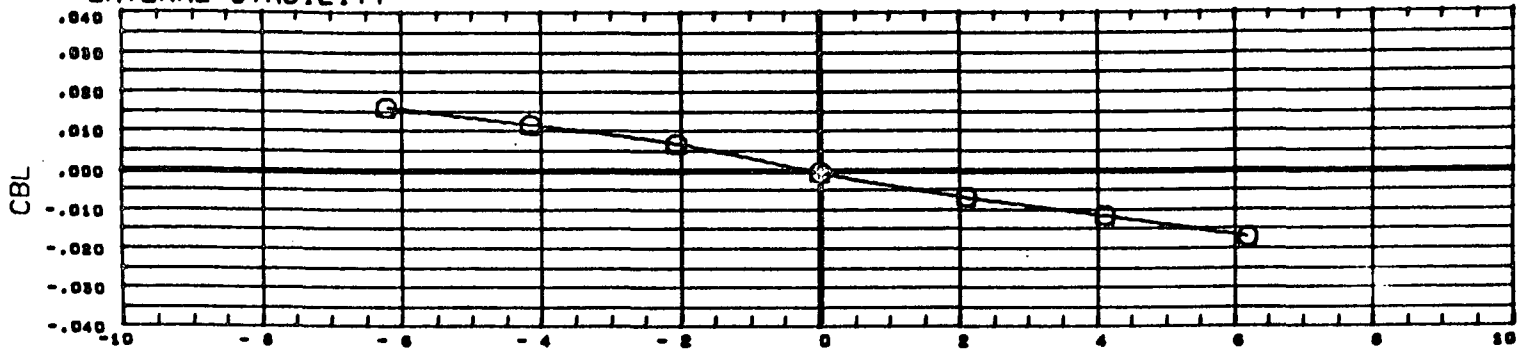
(C5306L)

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LATERAL STABILITY

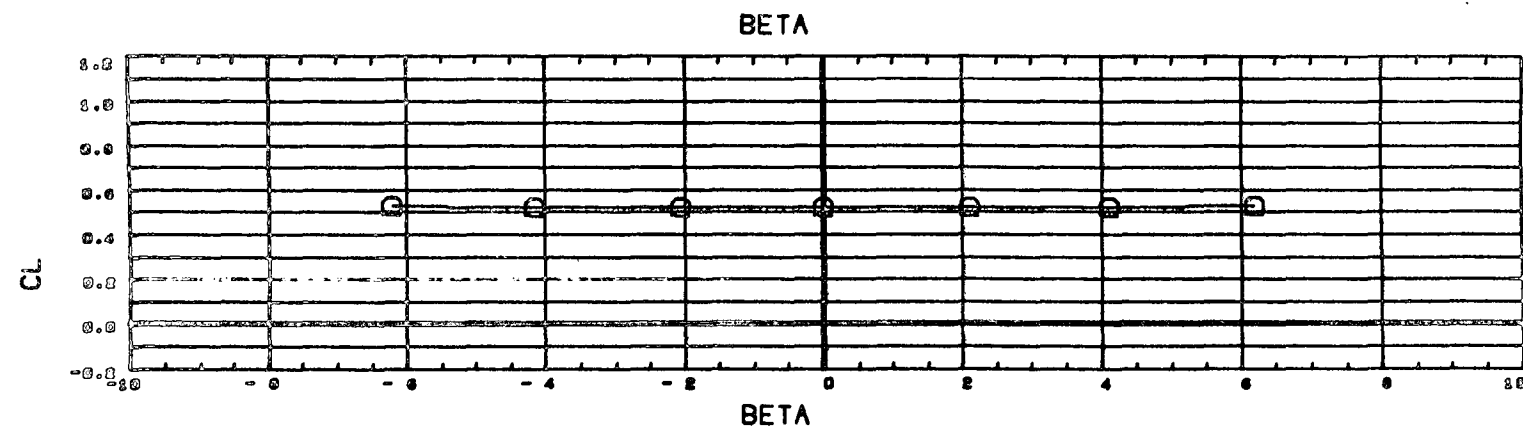
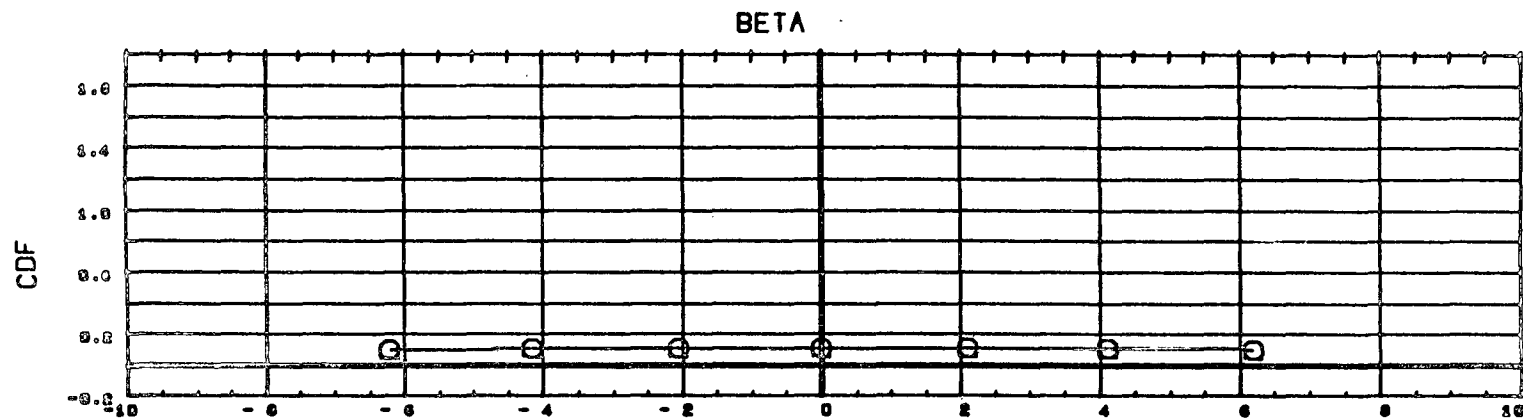
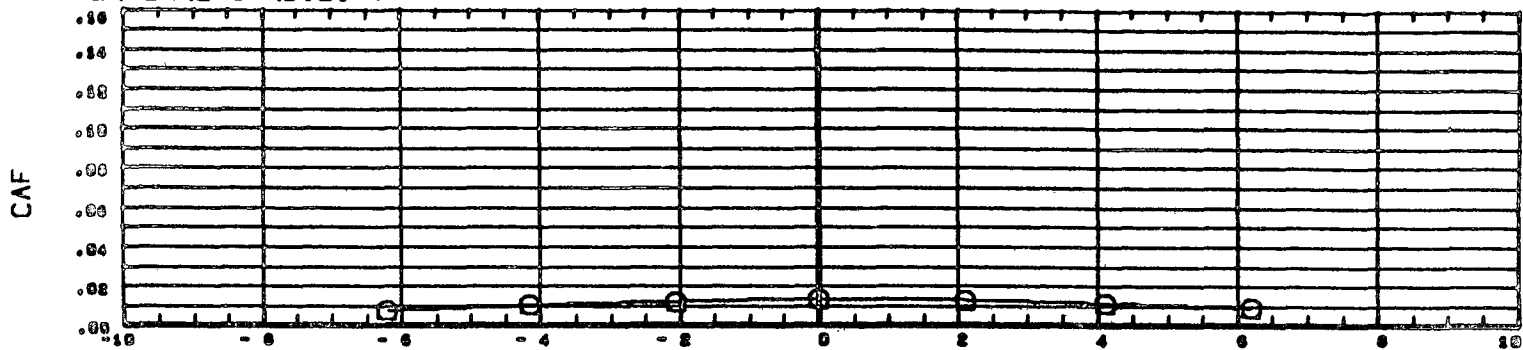


SYMBOL \square MACH 0.597 ALPHA 10.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.8836 80. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

LATERAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 ○ 0.897 ALPHA 10.000 RUDDER 0.000
 RUDDLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.5000 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

M513-MSFC MODELAR12161-2

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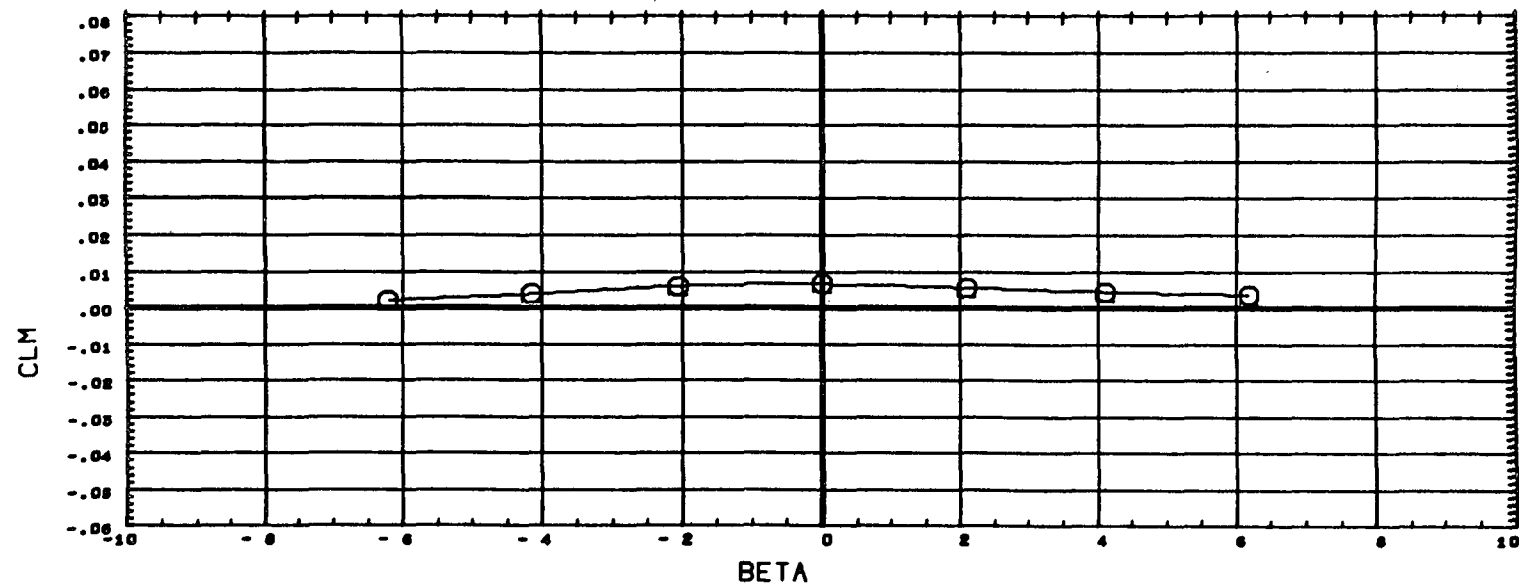
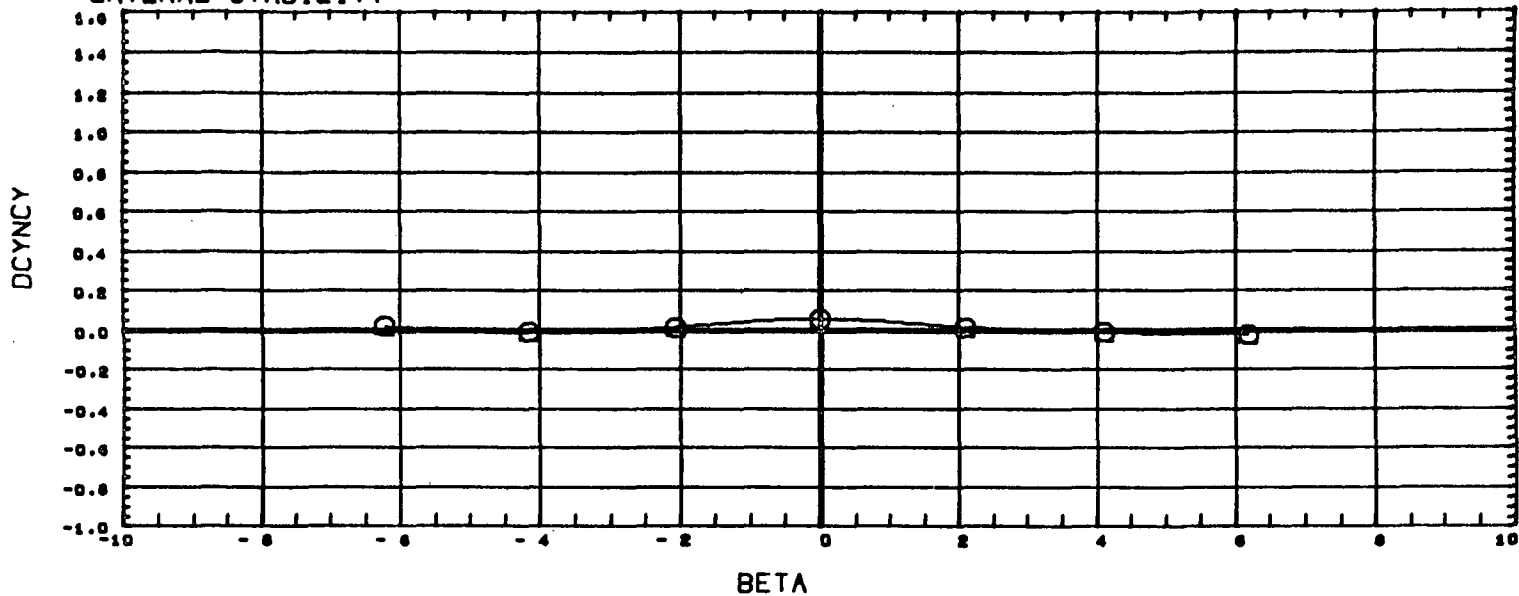
(C5322G)

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LATERAL STABILITY

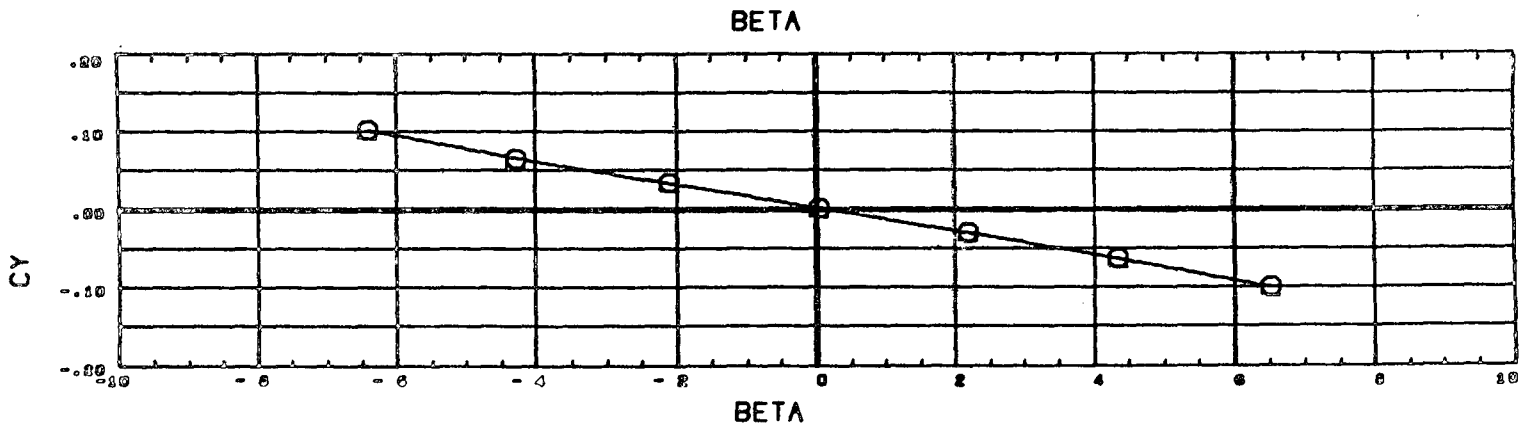
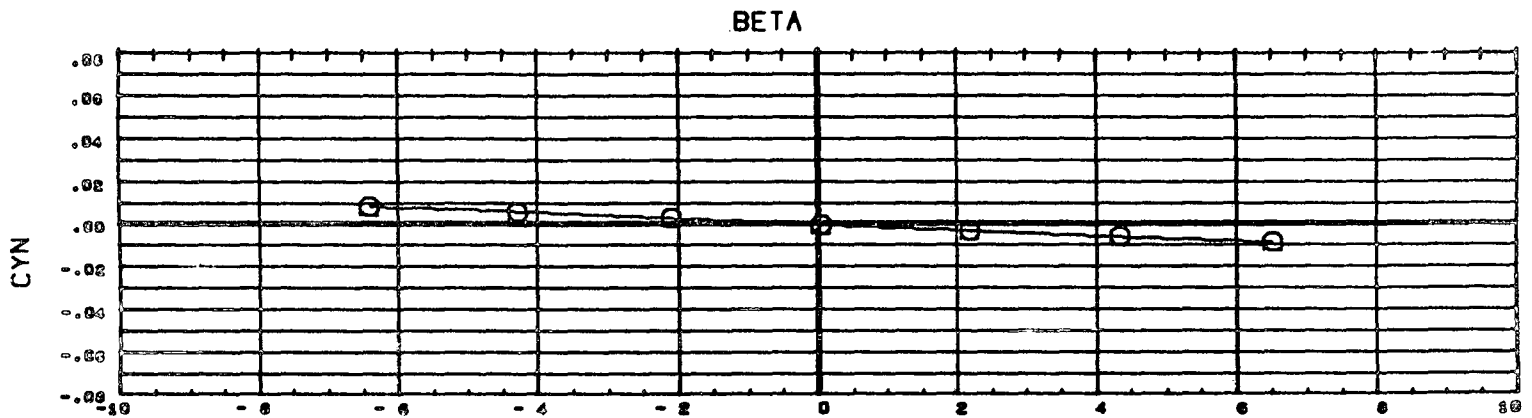
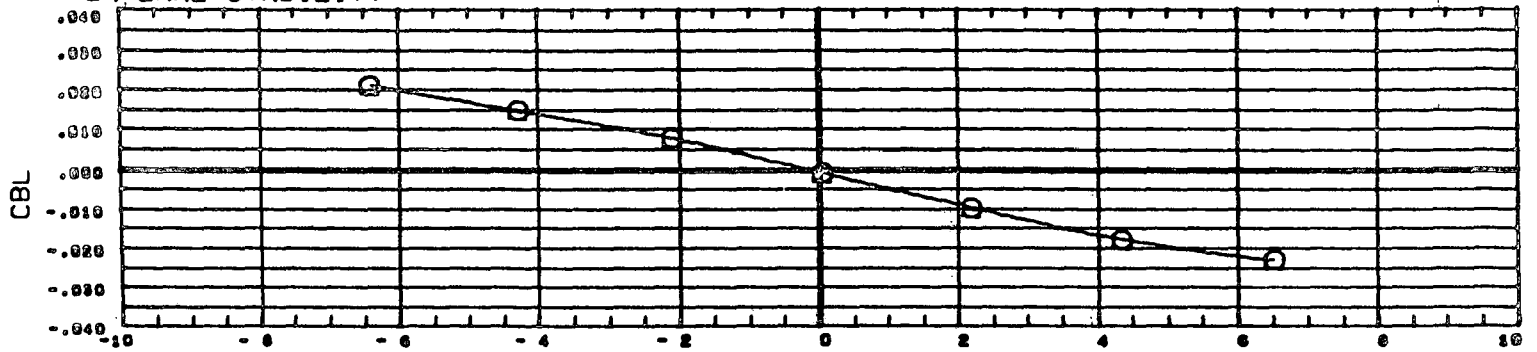


SYMBOL \square MACH 0.997
 PARAMETRIC VALUES
 ALPHA 10.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

LATERAL STABILITY



SYMBOL \square MACH 1.199 ALPHA 19.000 RUDDER 0.000
 PARAMETRIC VALUES
 RUDDLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

M513-MSFC MODELAR12161-2

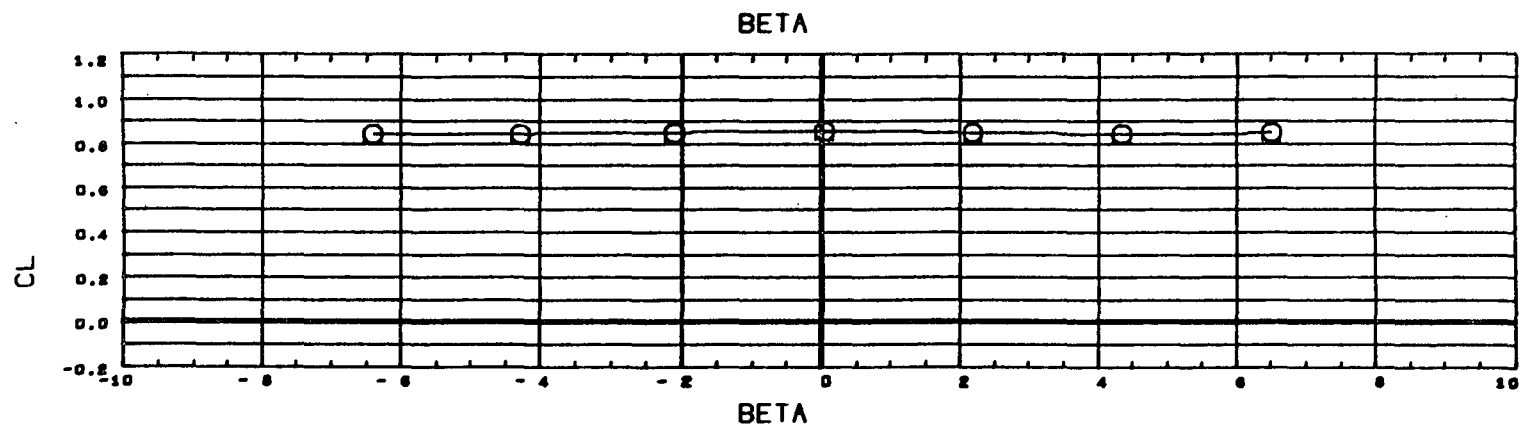
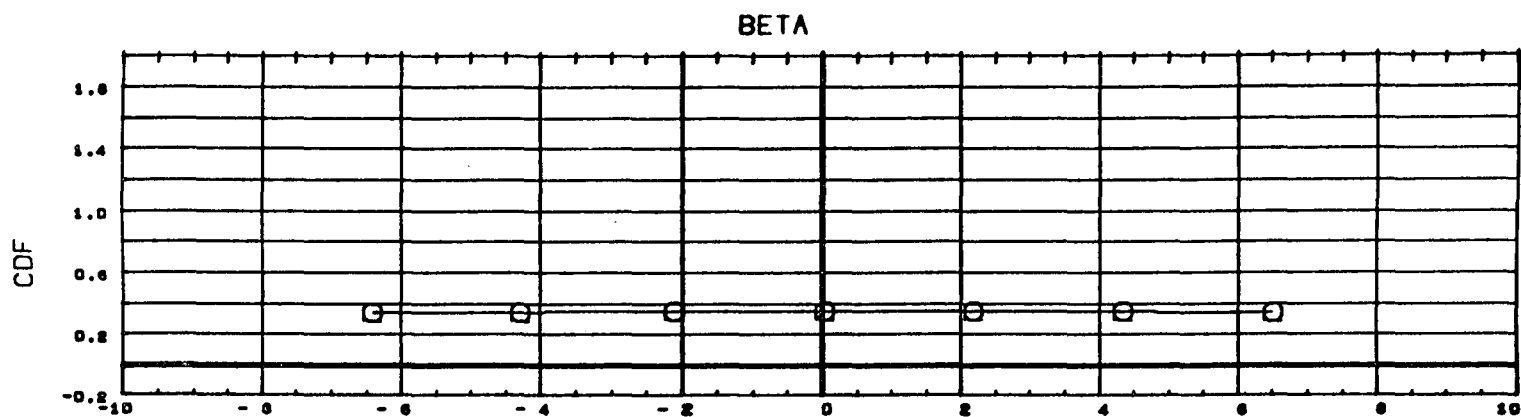
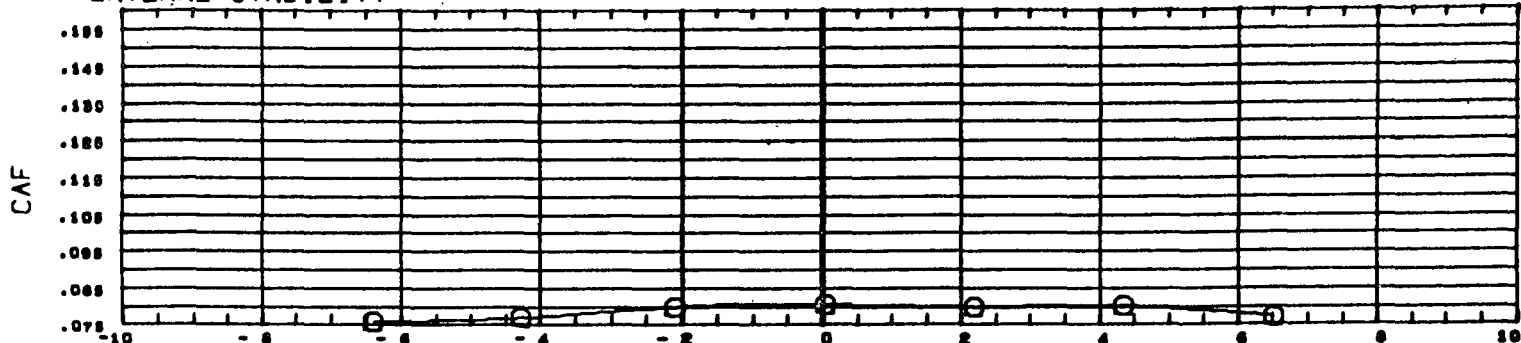
B5CW11AF2S1V7E2

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LATERAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 O 1.199 ALPHA 15.000 RUDDER 0.000
 RUOFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 89. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XNRP 1.4821 IN.
 YNRP 0.0000 IN.
 ZNRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

M513-MSFC MODELAR1216I-2

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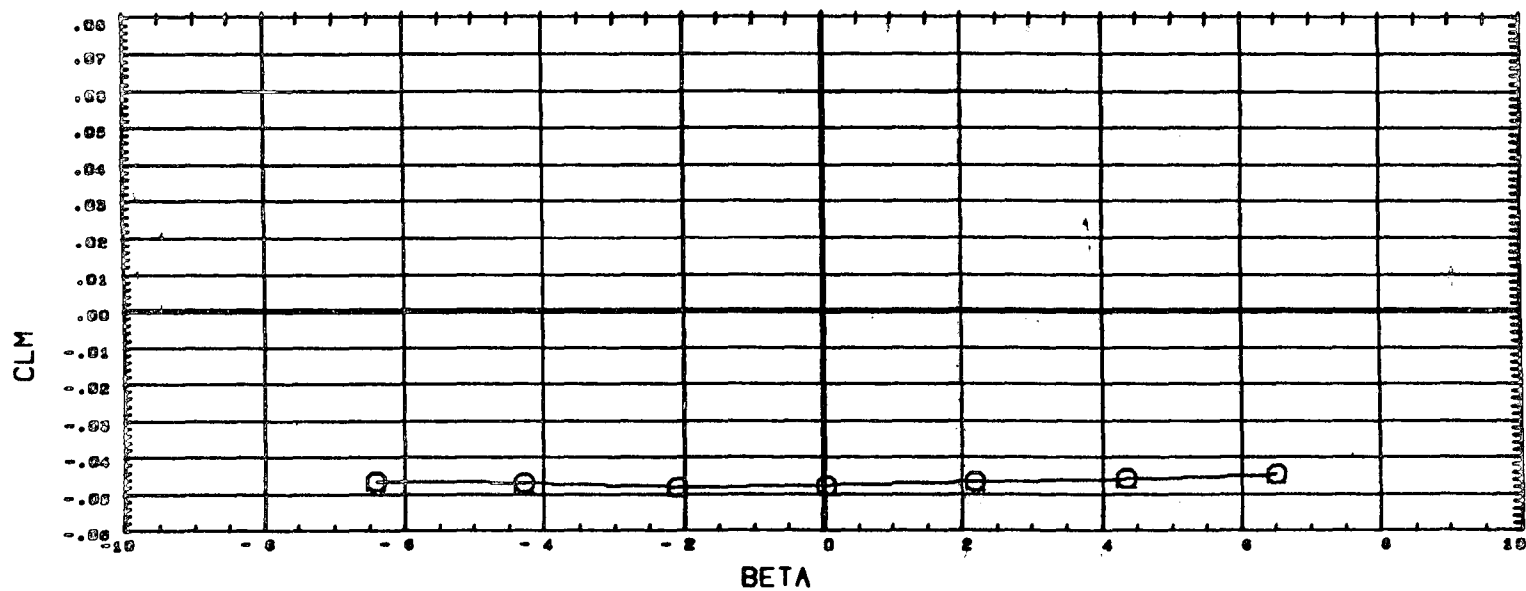
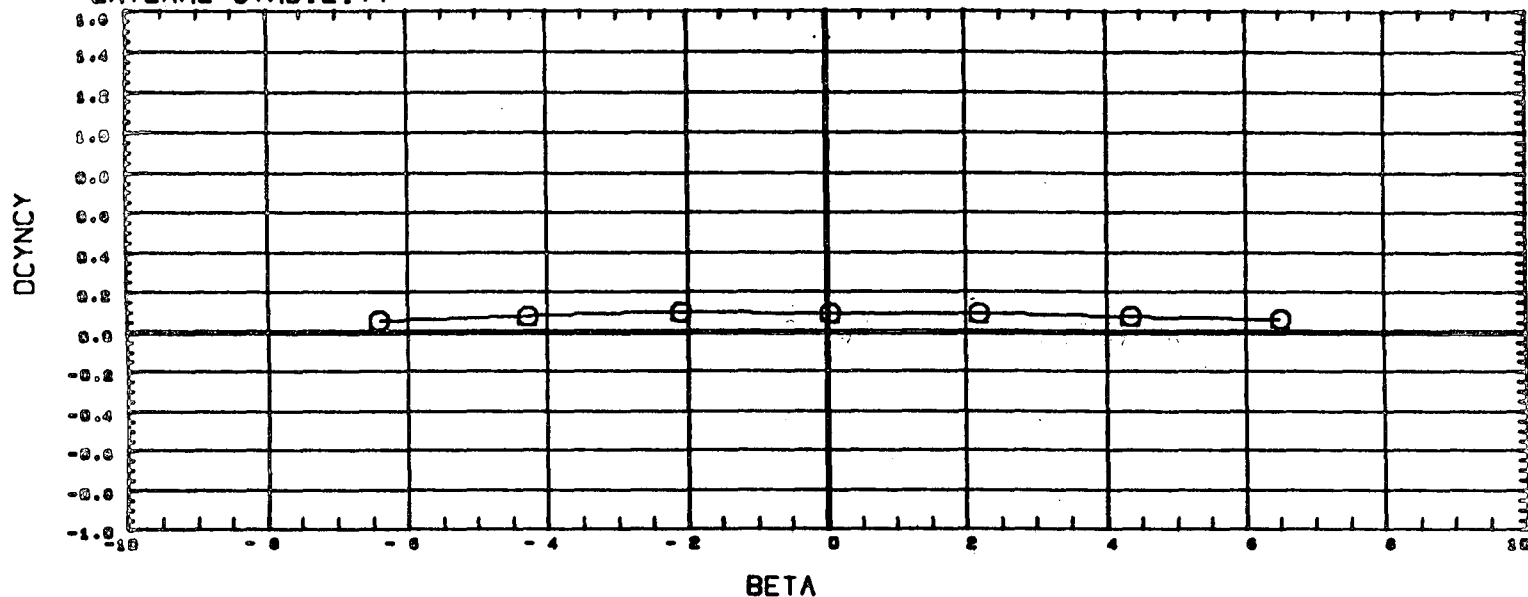
(C5322H)

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LATERAL STABILITY



SYMBOL \square MACH 1.120
 PARAMETRIC VALUES
 ALPHA 19.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.5060 IN.
 BREF 5.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E2

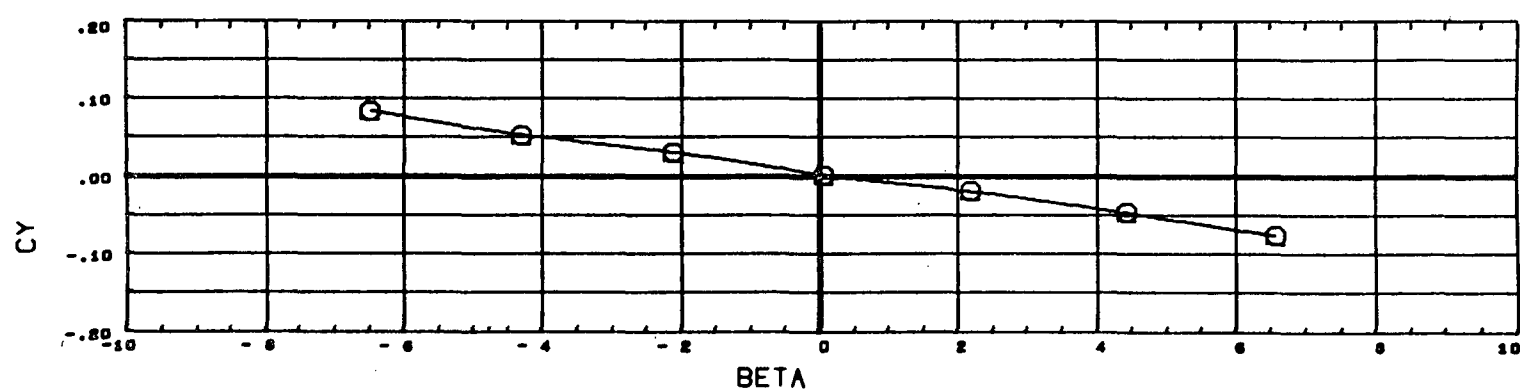
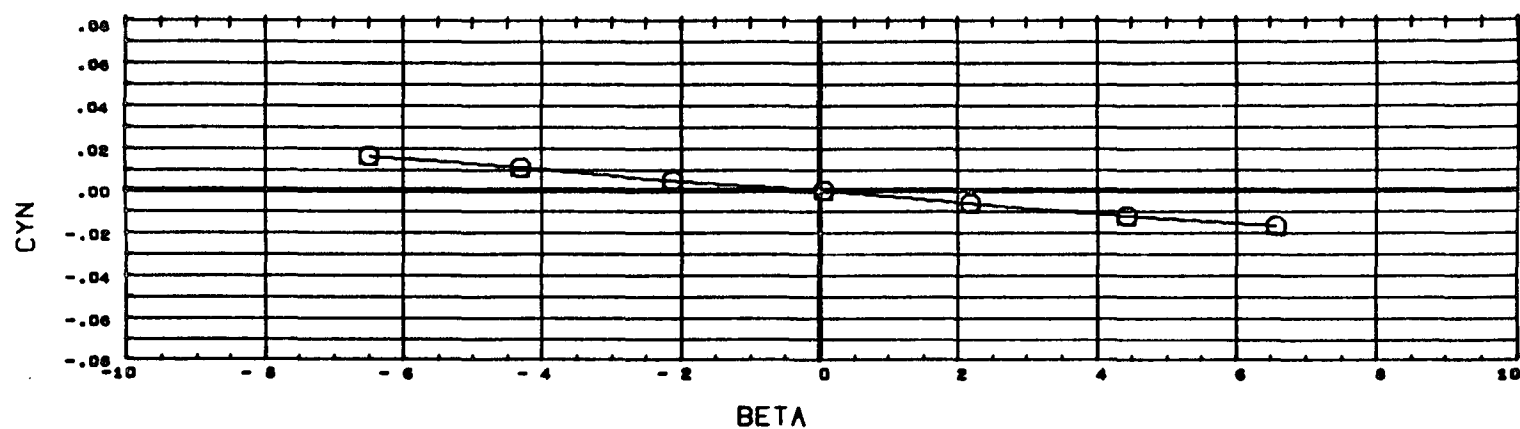
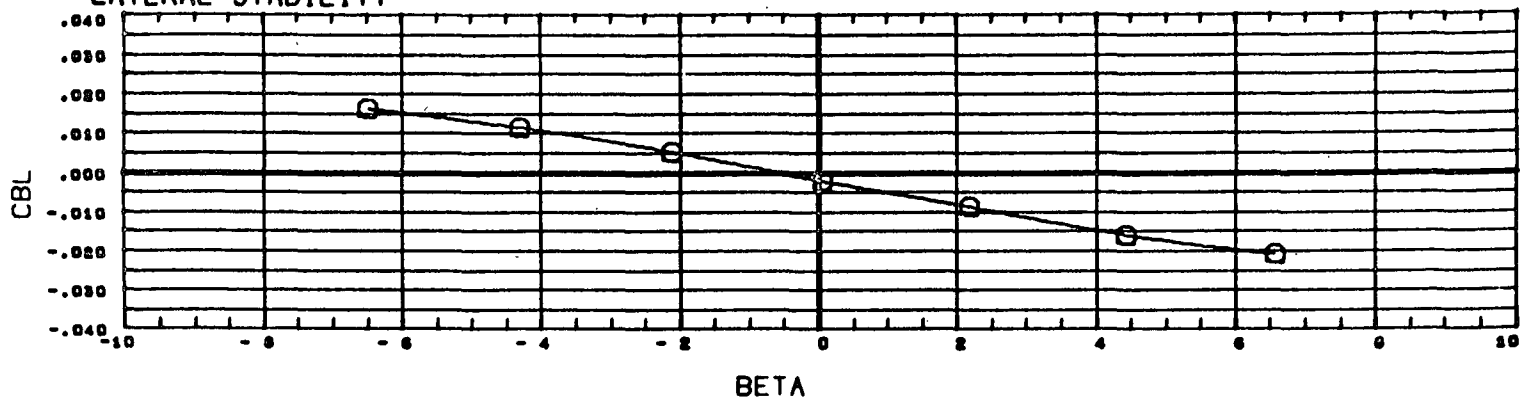
(C5322H)

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LATERAL STABILITY

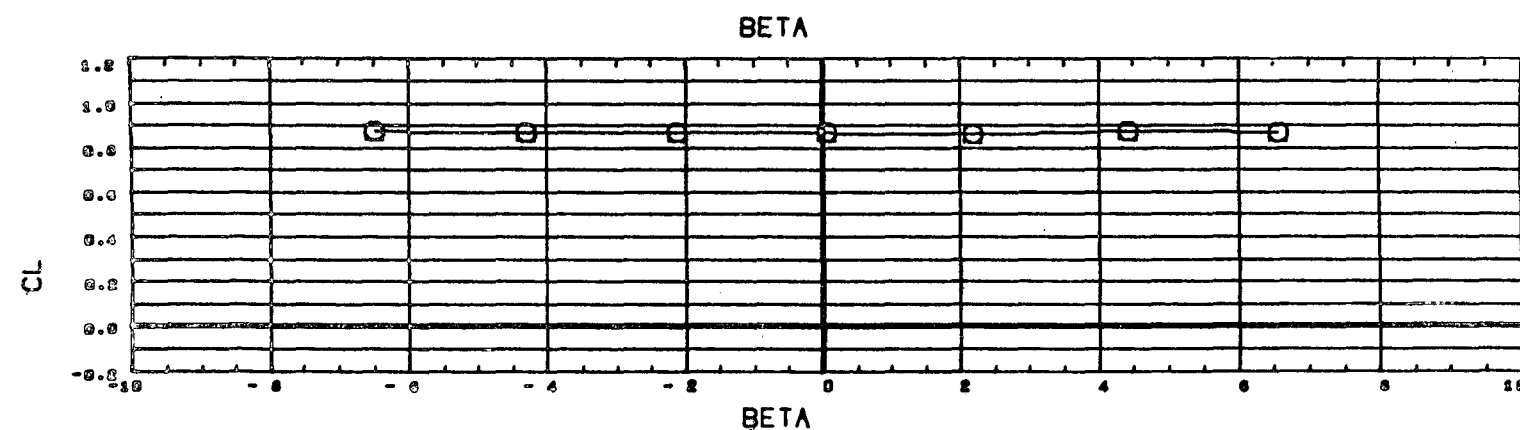
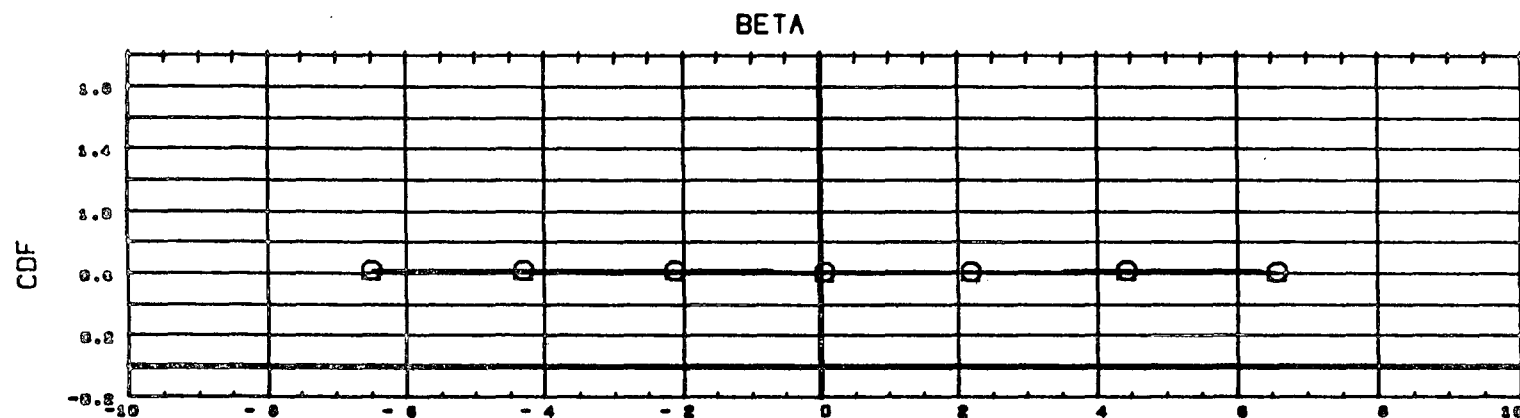
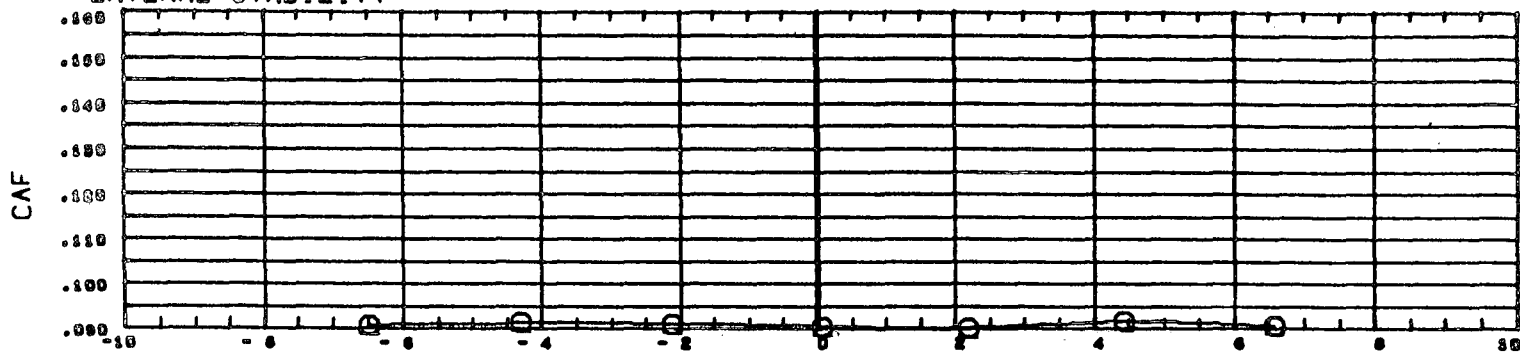


SYMBOL \square MACH 1.969
 PARAMETRIC VALUES
 ALPHA 25.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 30. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

LATERAL STABILITY

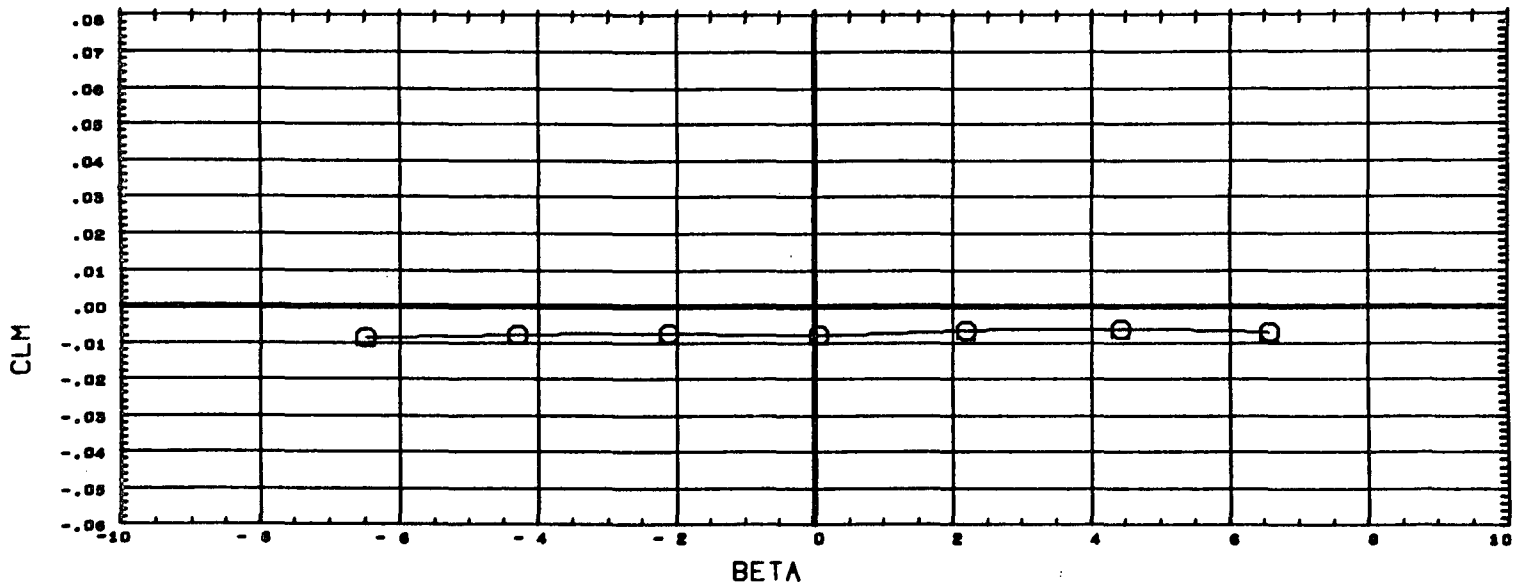
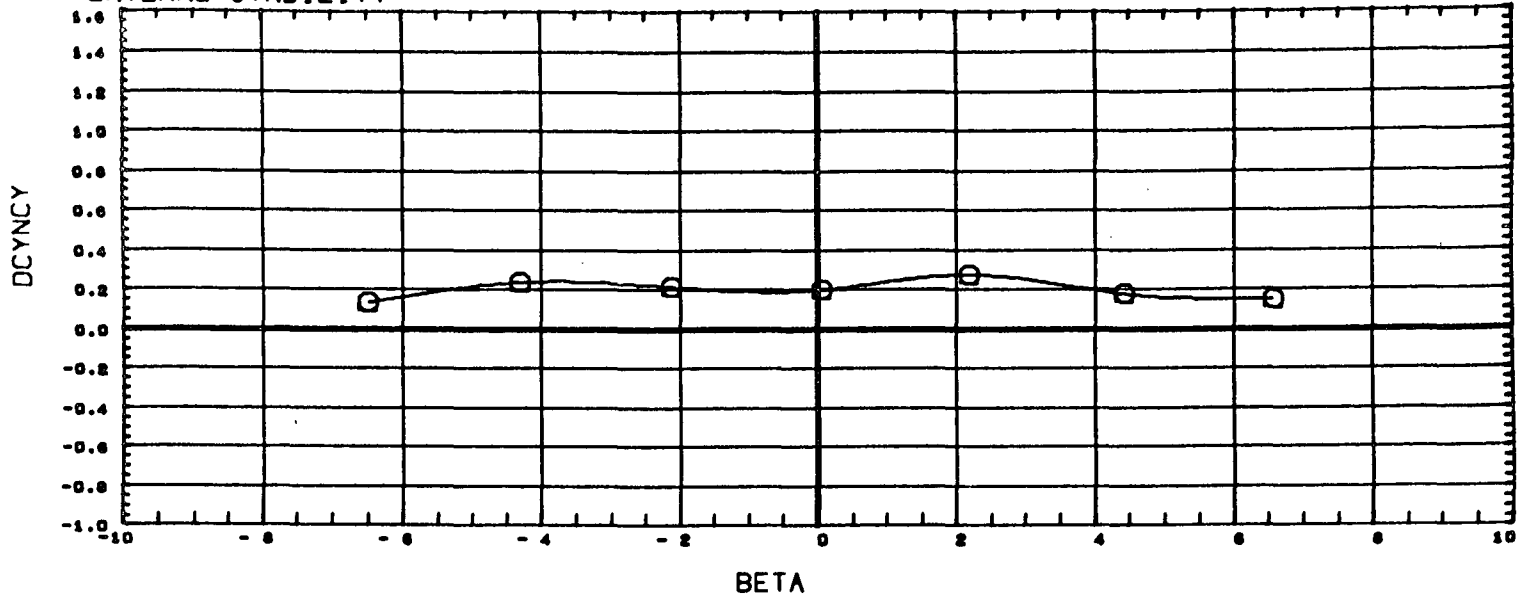


SYMBOL HACH PARAMETRIC VALUES
 O 1.059 ALPHA 25.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 89 IN.
 LREF 4.5000 IN.
 BREF 6.6350 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 66

LATERAL STABILITY



SYMBOL \square MACH 1.969 ALPHA 25.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.5080 IN.
 BREF 9.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

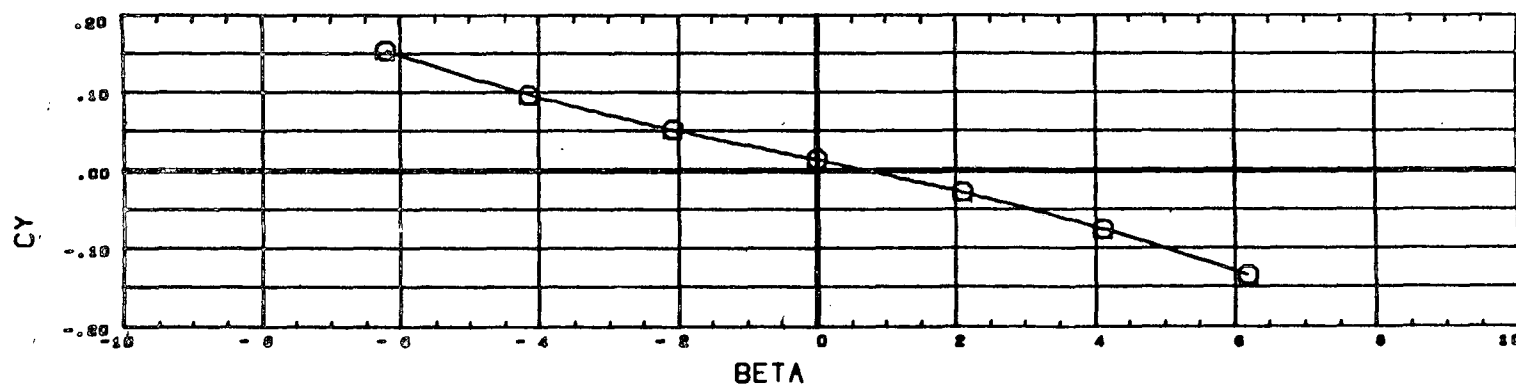
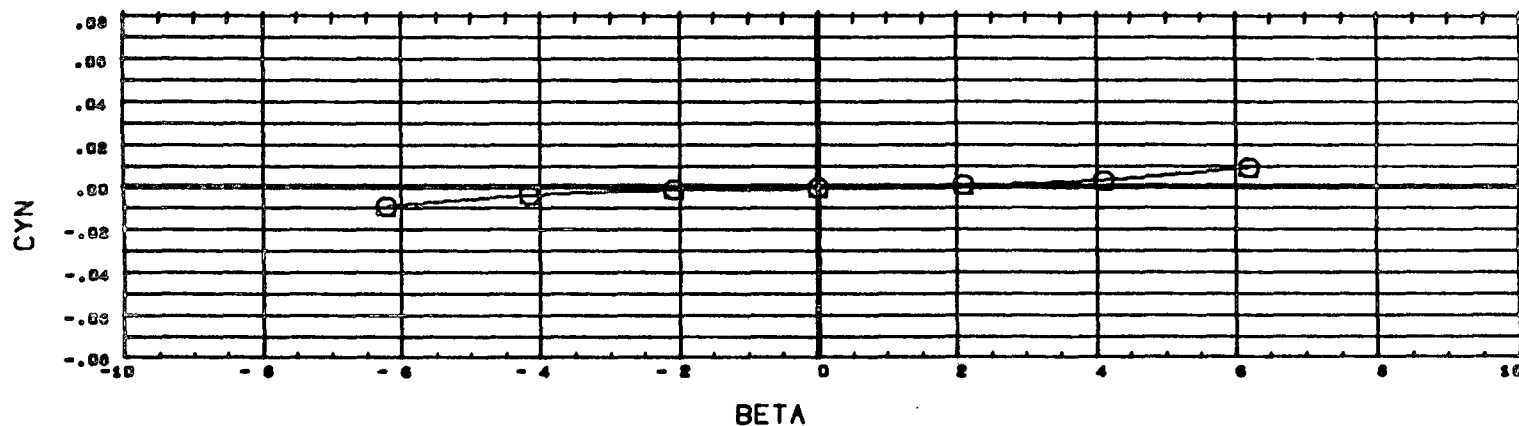
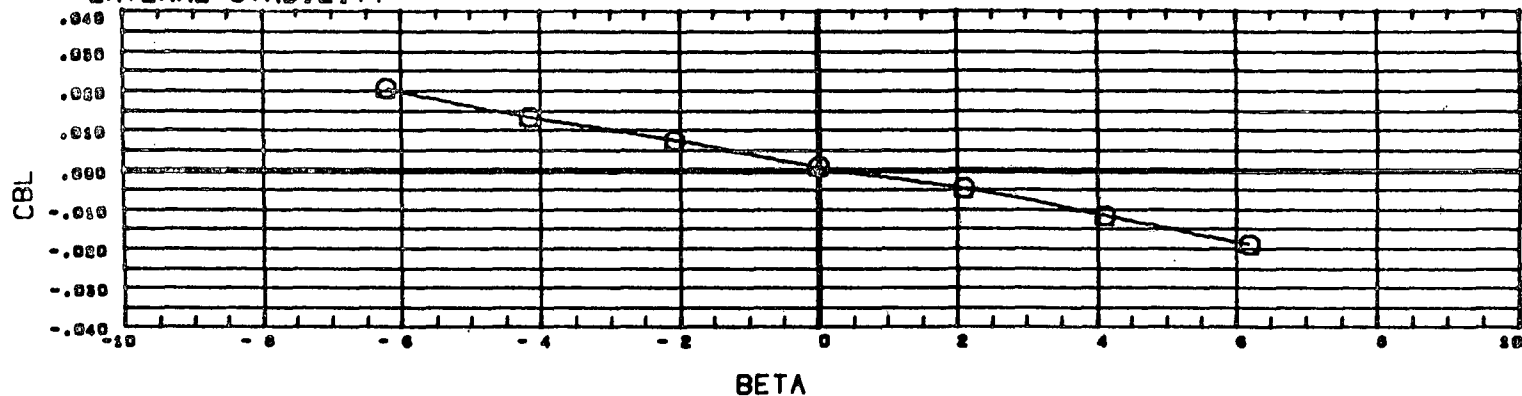
M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E2

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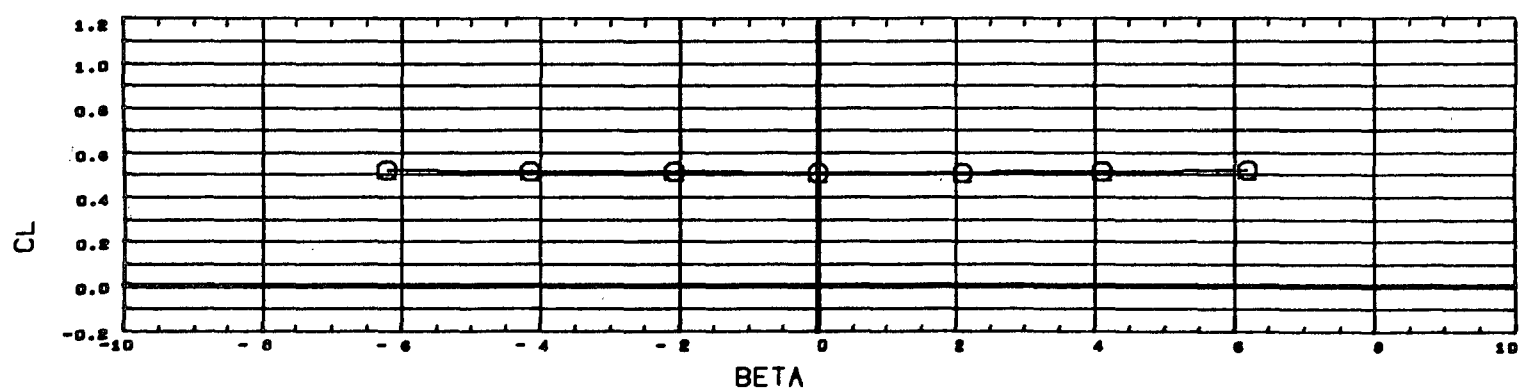
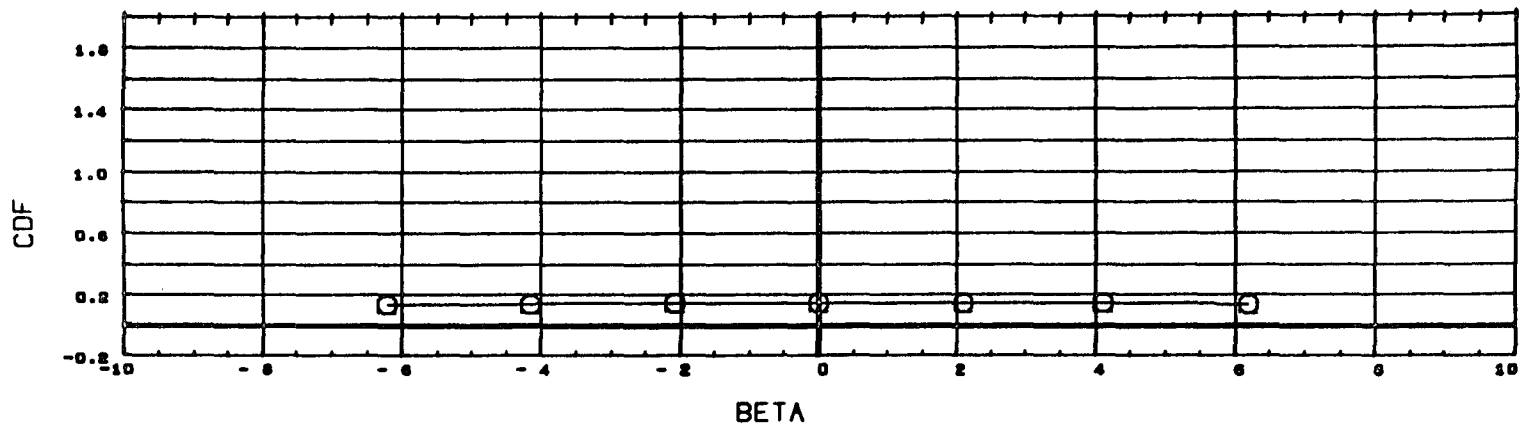
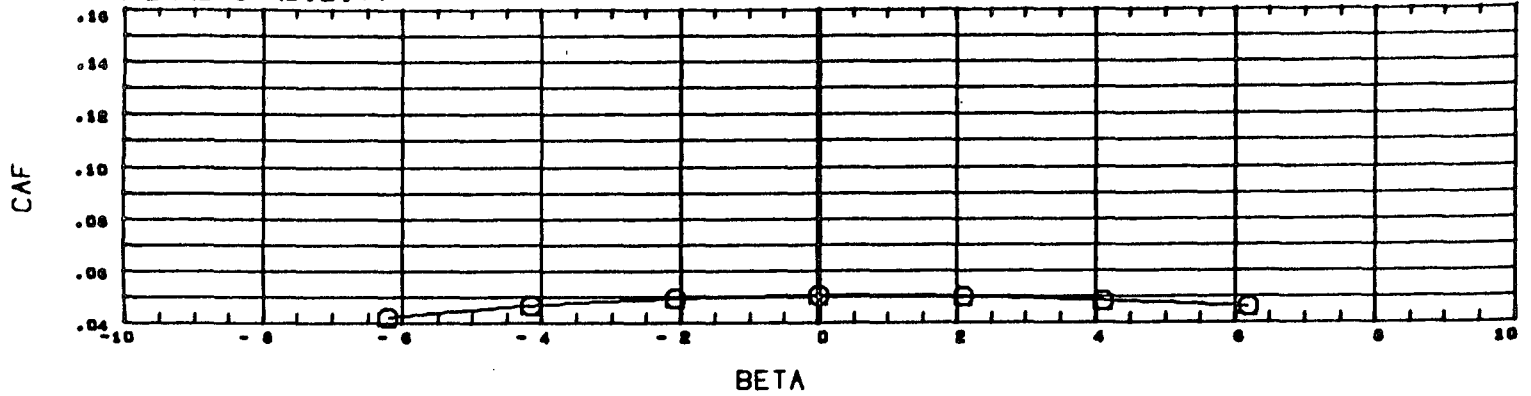


SYMBOL MACH PARAMETRIC VALUES
 O 0.596 ALPHA 10.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 SQ. IN.
 LREF 4.5000 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

LATERAL STABILITY

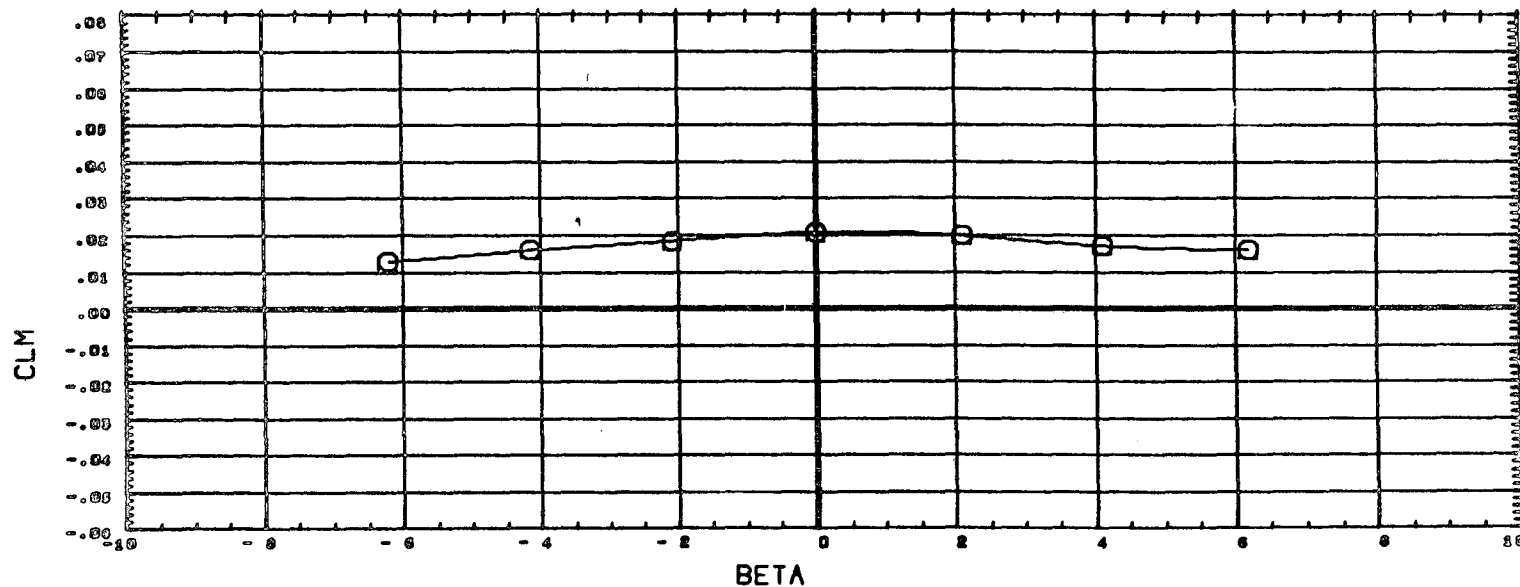
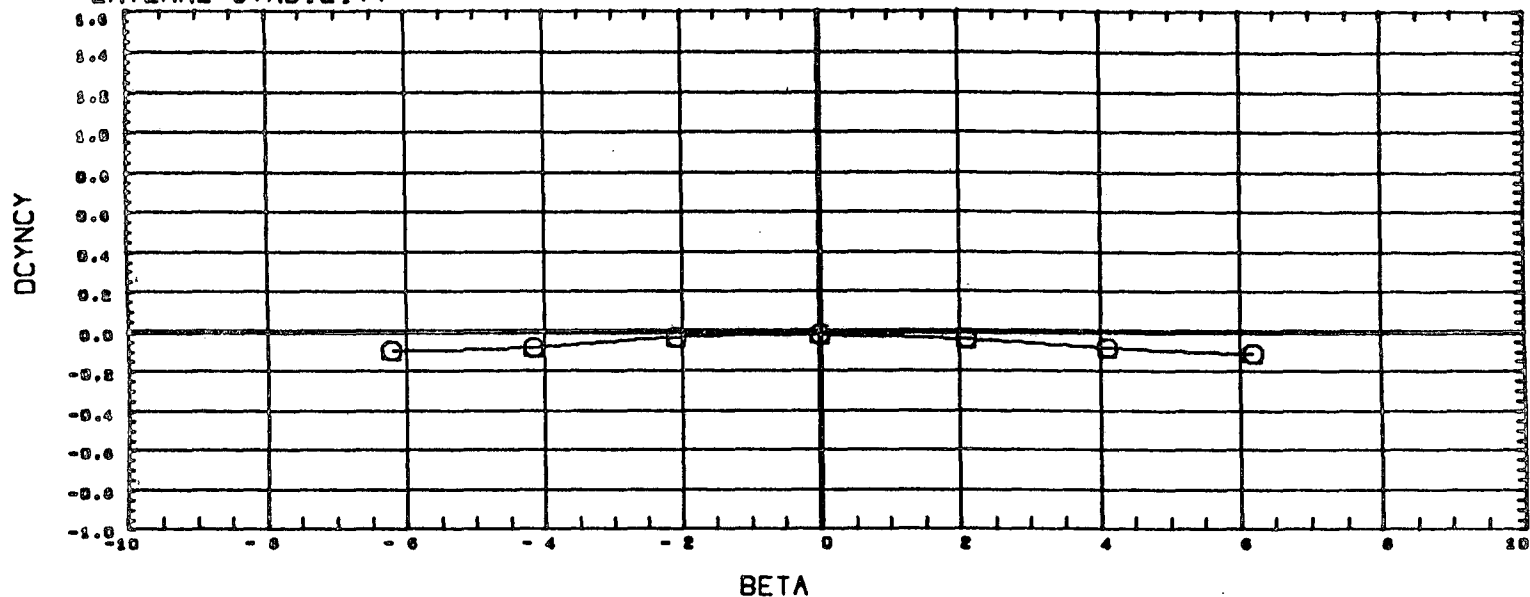


SYMBOL MACH PARAMETRIC VALUES
 O 0.998 ALPHA 10.000 RUDDER 0.000
 RUDDL 30.000

REFERENCE INFORMATION
 SREF 14.6636 88. IN.
 LREF 4.5060 IN.
 BREF 5.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

LATERAL STABILITY

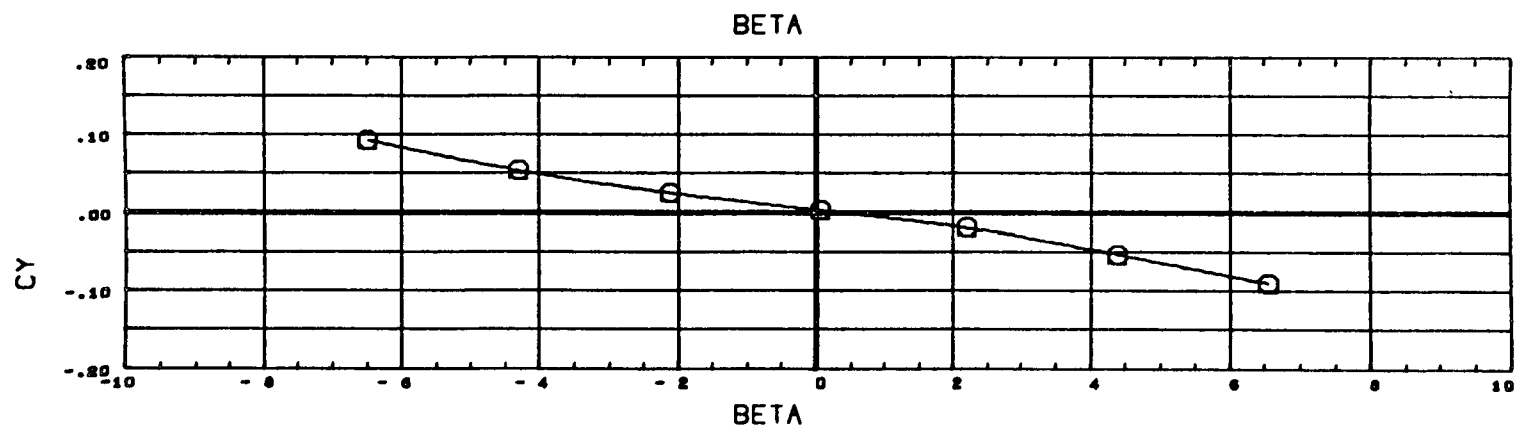
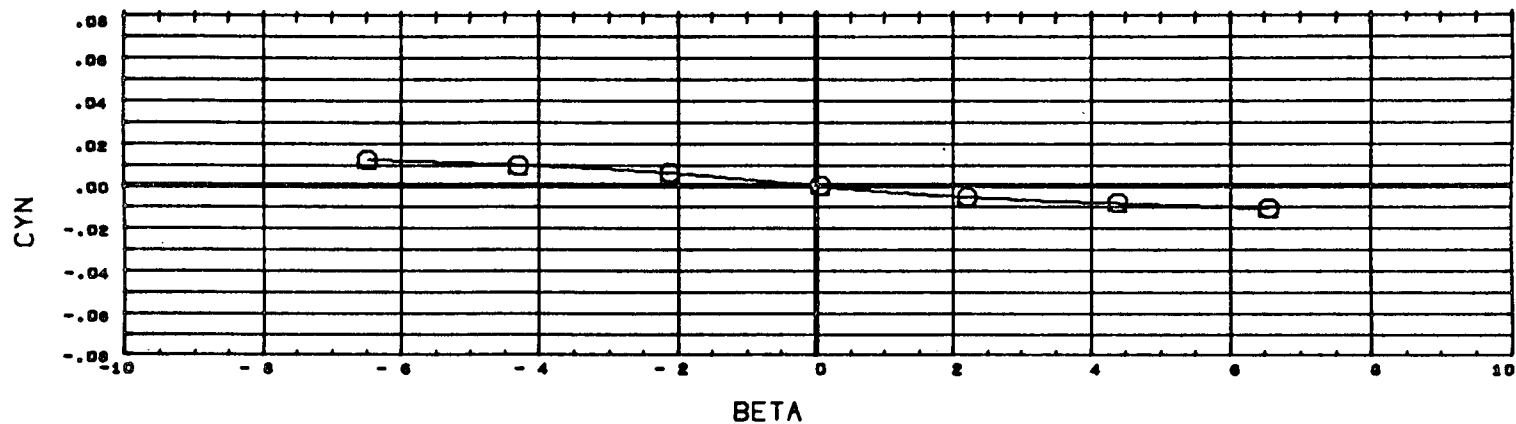
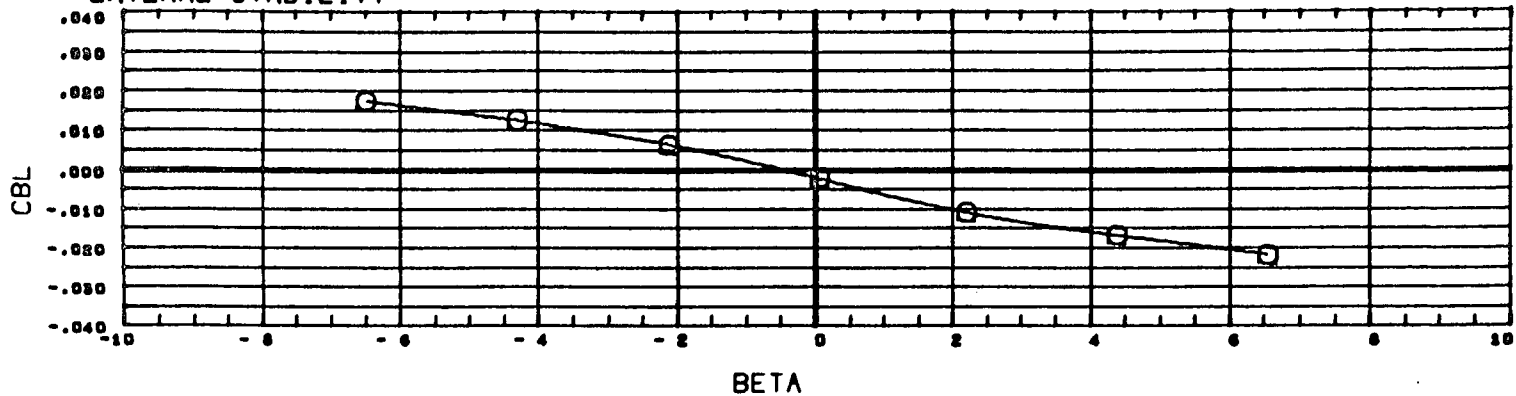


SYMBOL	MACH	PARAMETRIC VALUES			
○	0.986	ALPHA	10.000	RUDDER	0.000
		RUDFLR	30.000		

REFERENCE INFORMATION		
SREF	14.6636	06. IN.
LREF	4.9080	IN.
BREF	9.6550	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE 6C

LATERAL STABILITY



SYMBOL \bigcirc MACH 1.966 ALPHA 25.000 RUDDER 0.000
 RUDFLR 30.000

DATA HIST. CODE GC

REFERENCE INFORMATION
 SREF 14.6636 90. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

M513-MSFC MODELAR12161-2

B5CW11AV10S1V7E2

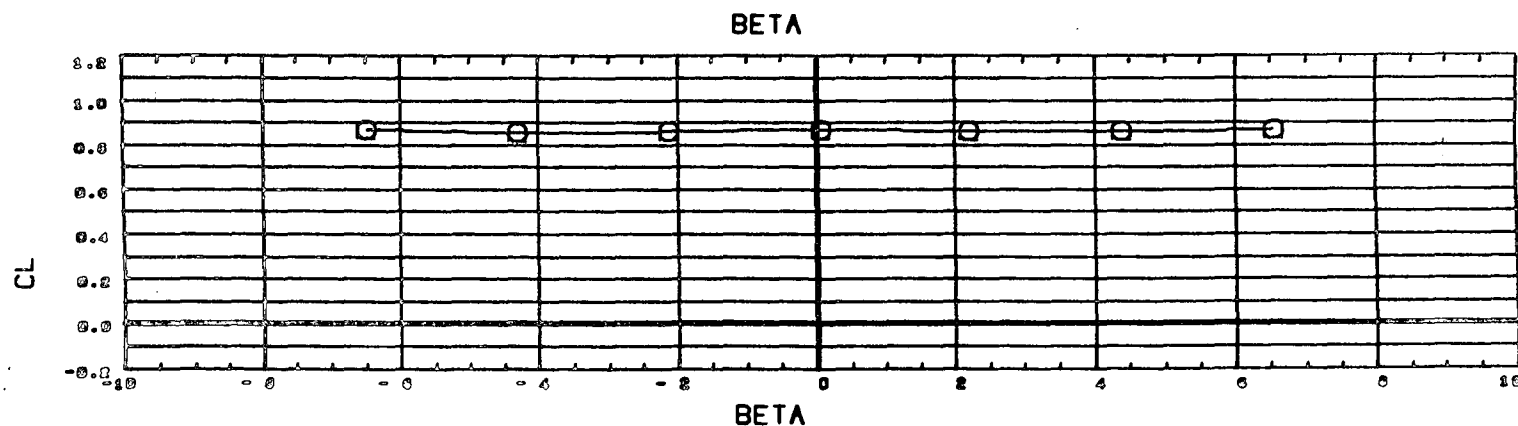
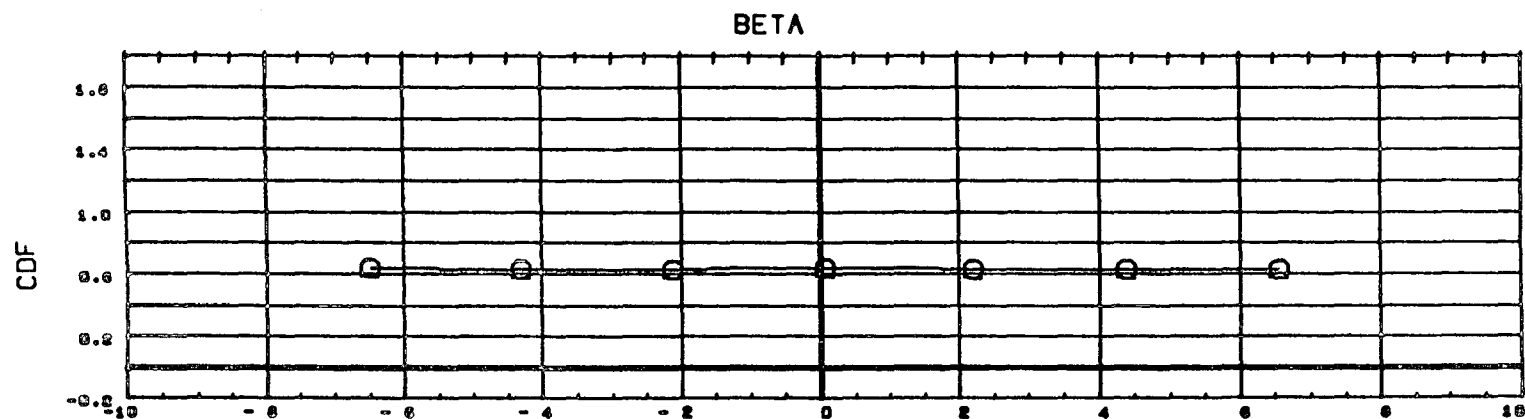
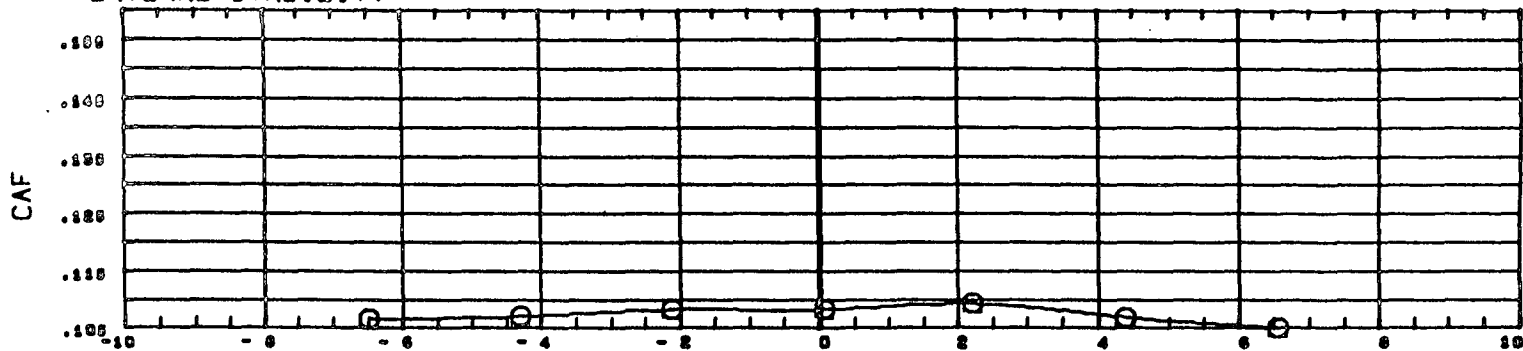
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LATERAL STABILITY



SYMBOL \bigcirc MACH 1.000
 PARAMETRIC VALUES
 ALPHA 25.000 RUDDER 0.000
 RUDDLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.3080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0030

DATA HIST. CODE 6C

M513-MSFC MODELAR1216I-2

B5CW11AV10S1V7E2

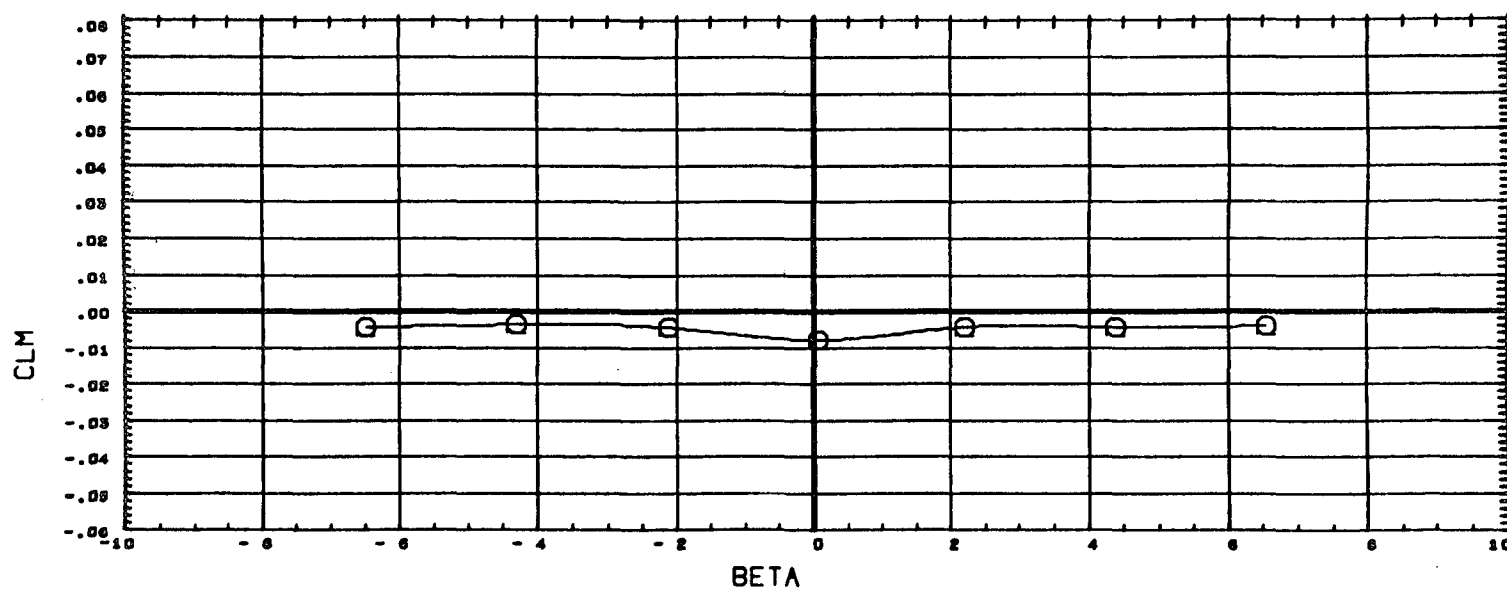
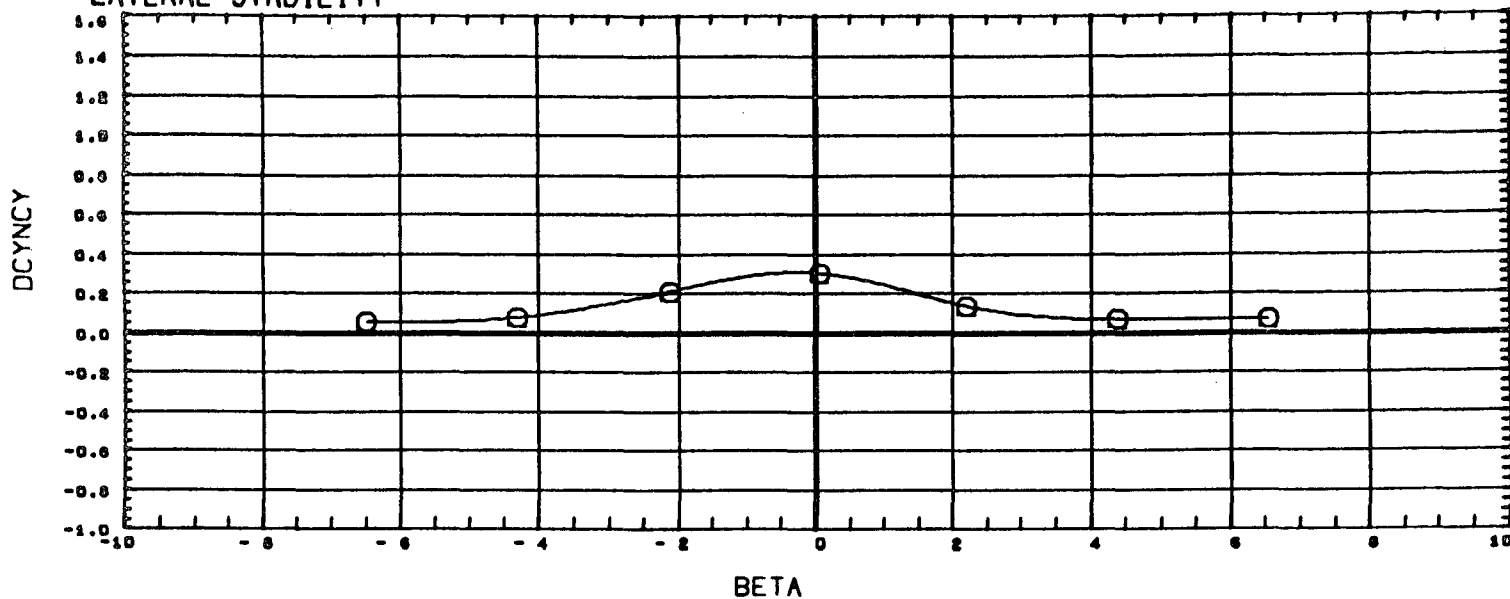
(C5314L)

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LATERAL STABILITY

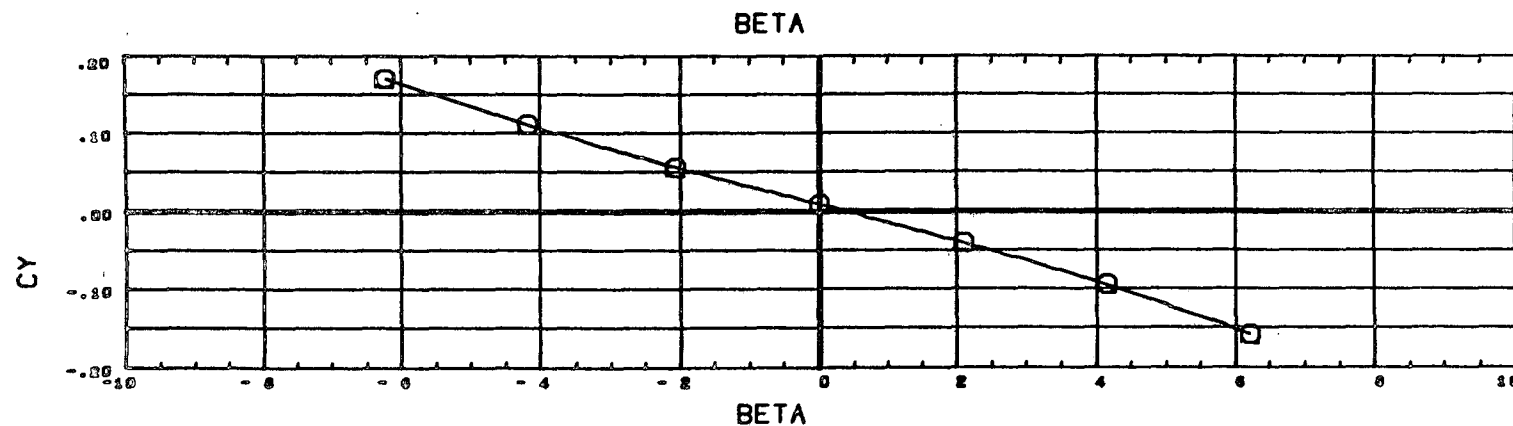
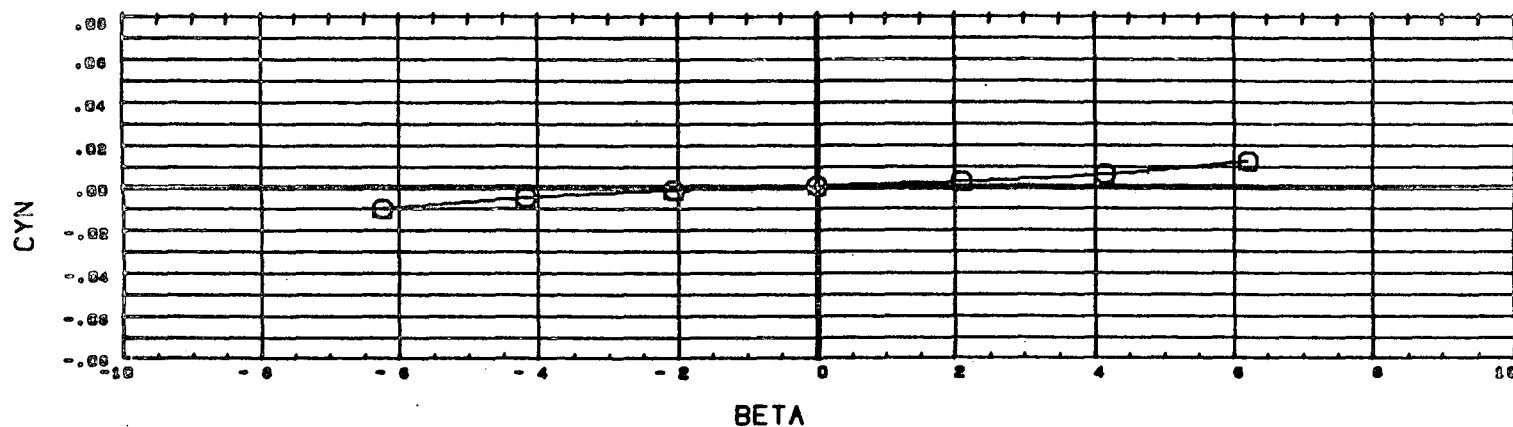
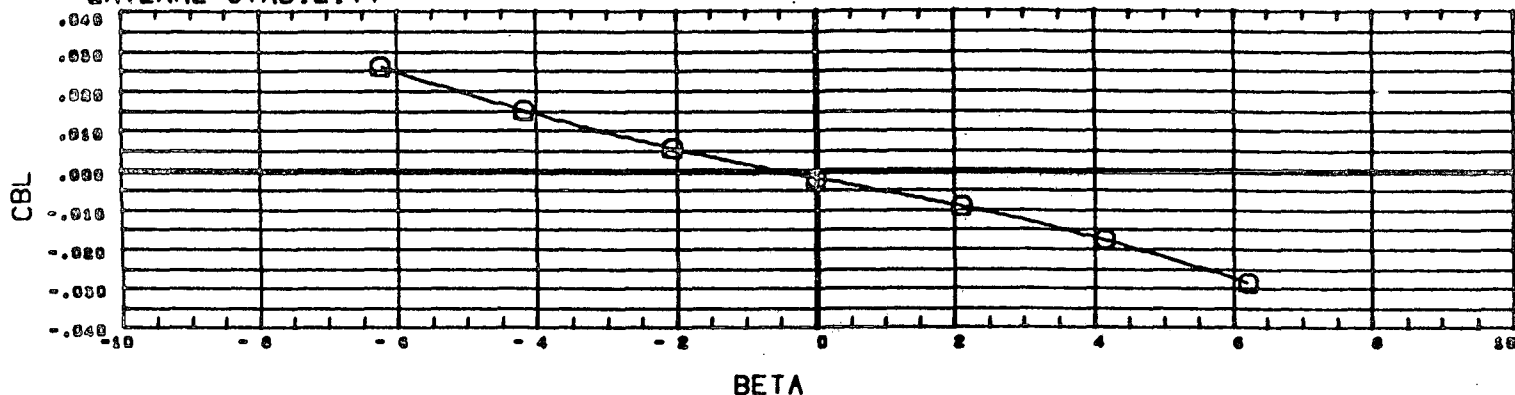


SYMBOL \bigcirc MACH 1.966 ALPHA 25.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0054

DATA HIST. CODE 6C

LATERAL STABILITY



SYMBOL \square MACH 0.001 ALPHA 10.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 SQ. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

M513-MSFC MODELAR1216I-2

B5CW11AF2S1E2V8

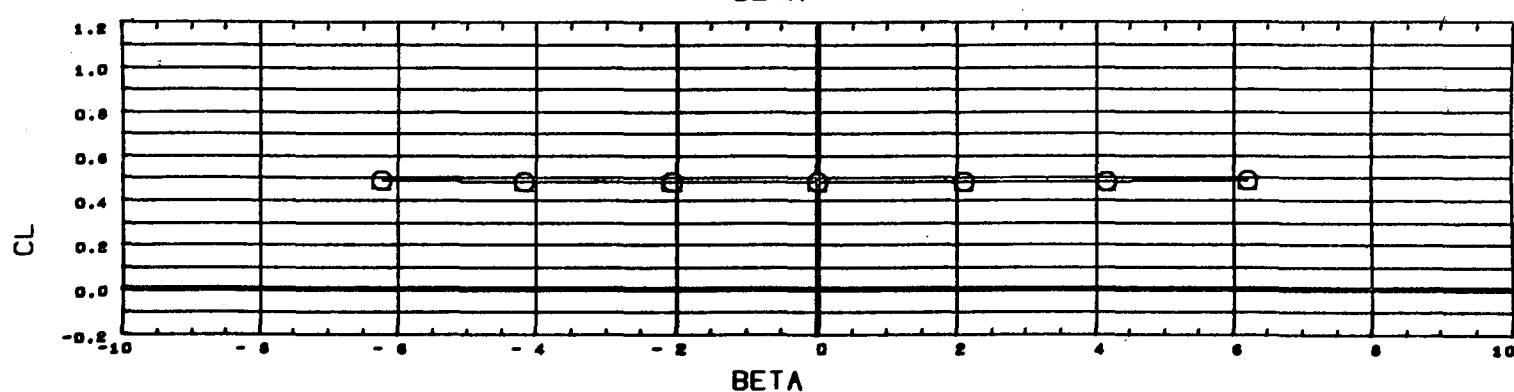
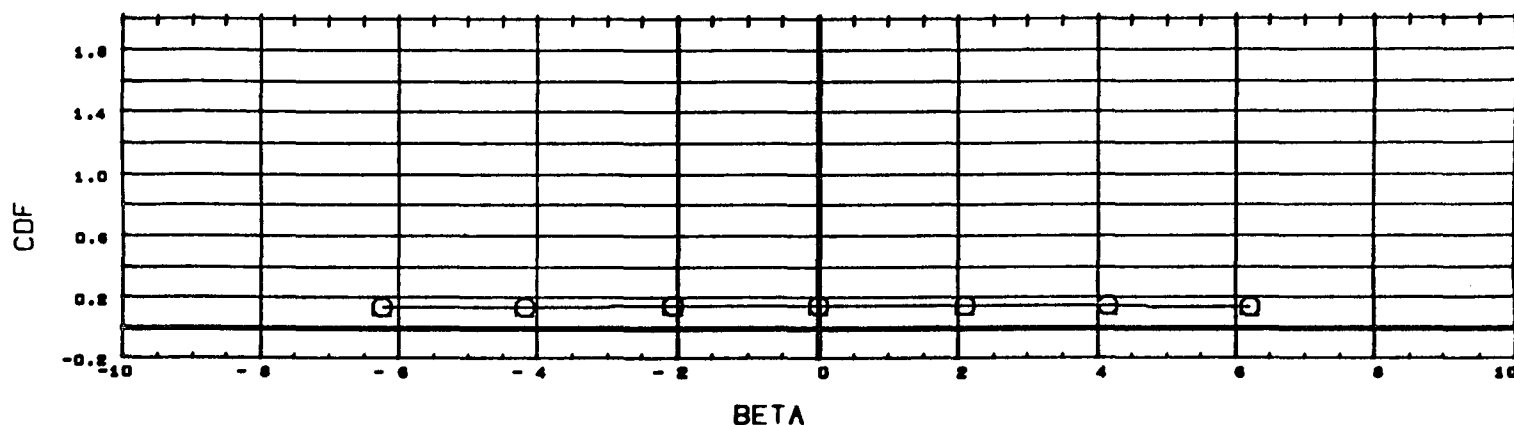
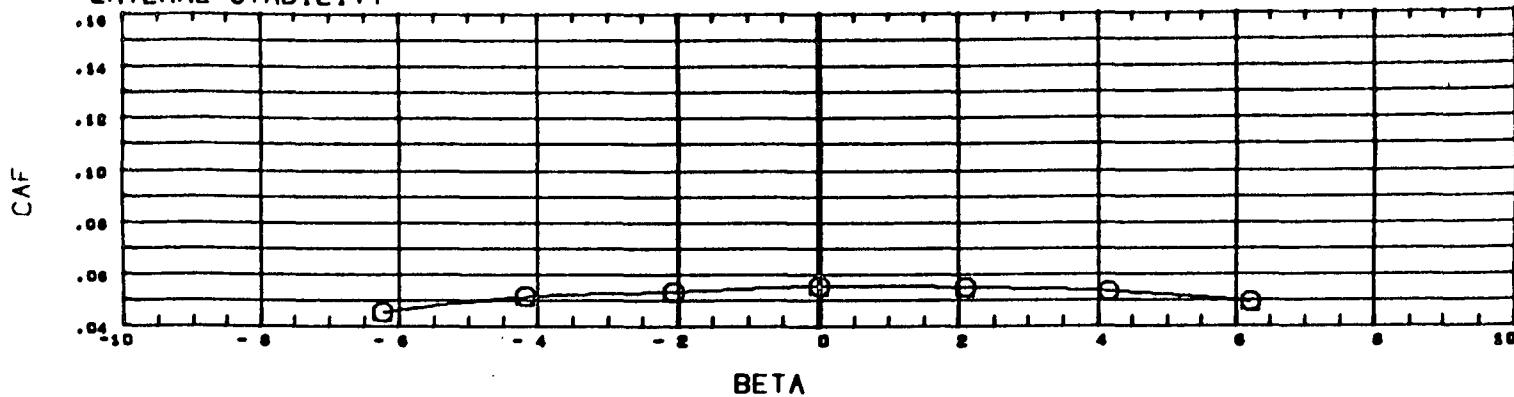
(C5311G)

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LATERAL STABILITY



SYMBOL \bigcirc MACH 0.601
 PARAMETRIC VALUES
 ALPHA 10.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.8836 80. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

M513-MSFC MODELAR12161-2

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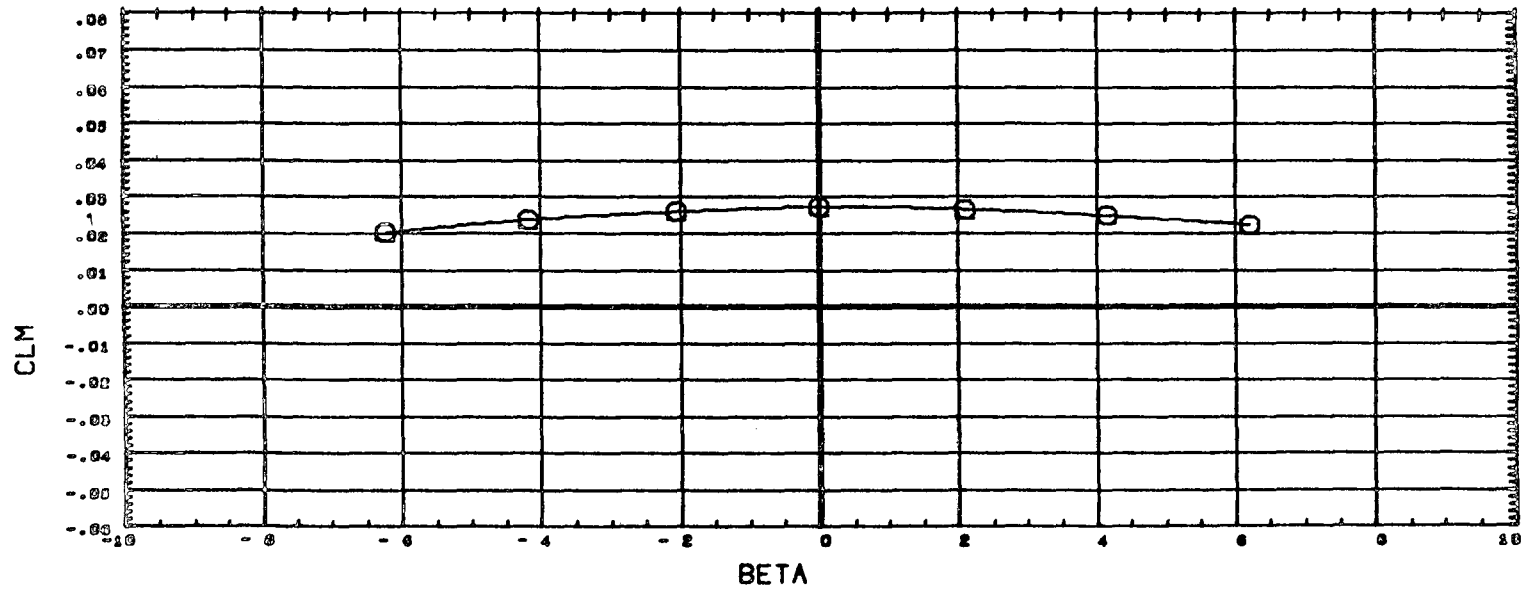
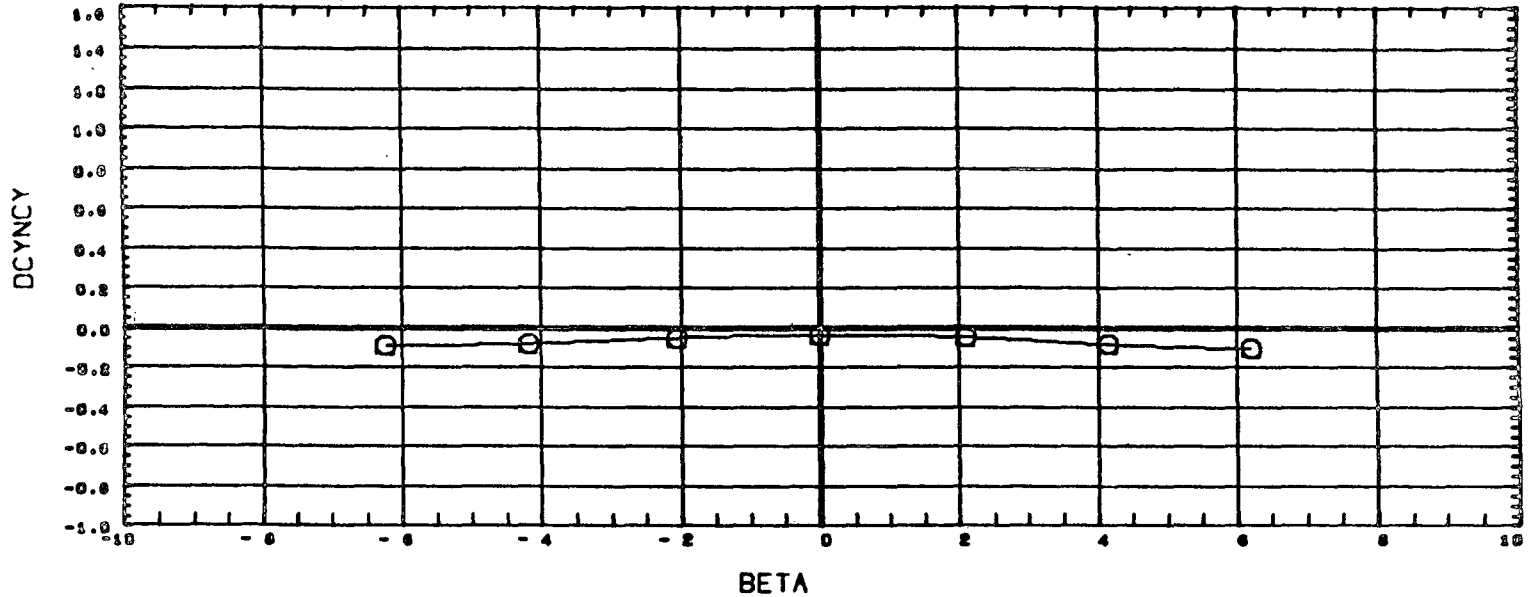
(C5311G)

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LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
○	0.601	ALPHA	10.000	RUDDER 0.000
		RUDFLR	30.000	

REFERENCE INFORMATION		
SRFP	14.6836	98. IN.
LRFP	4.5080	IN.
DRFP	5.6590	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA MIST. CODE GC

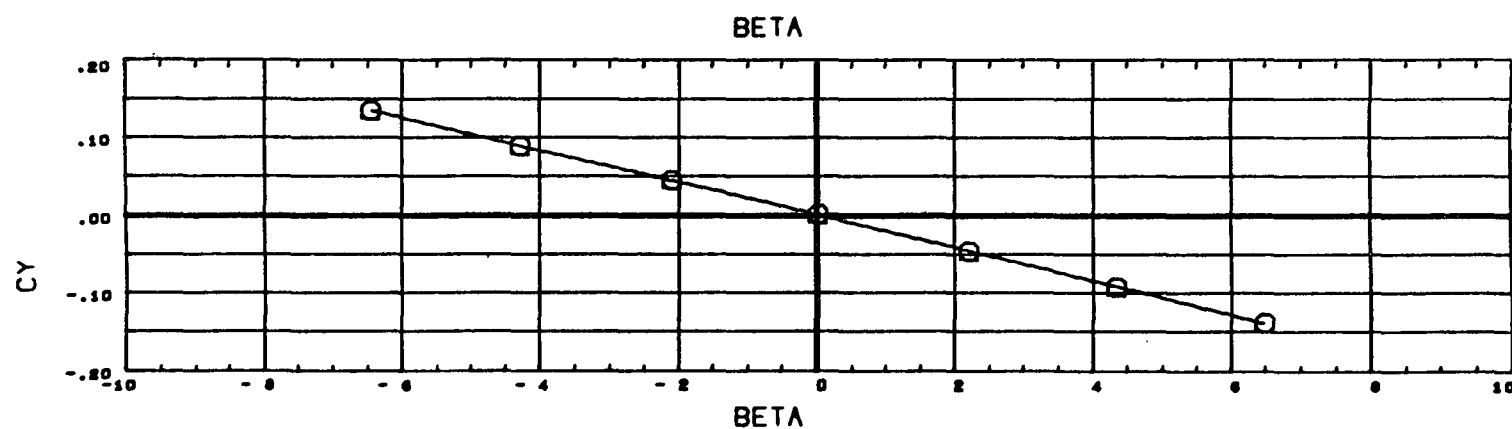
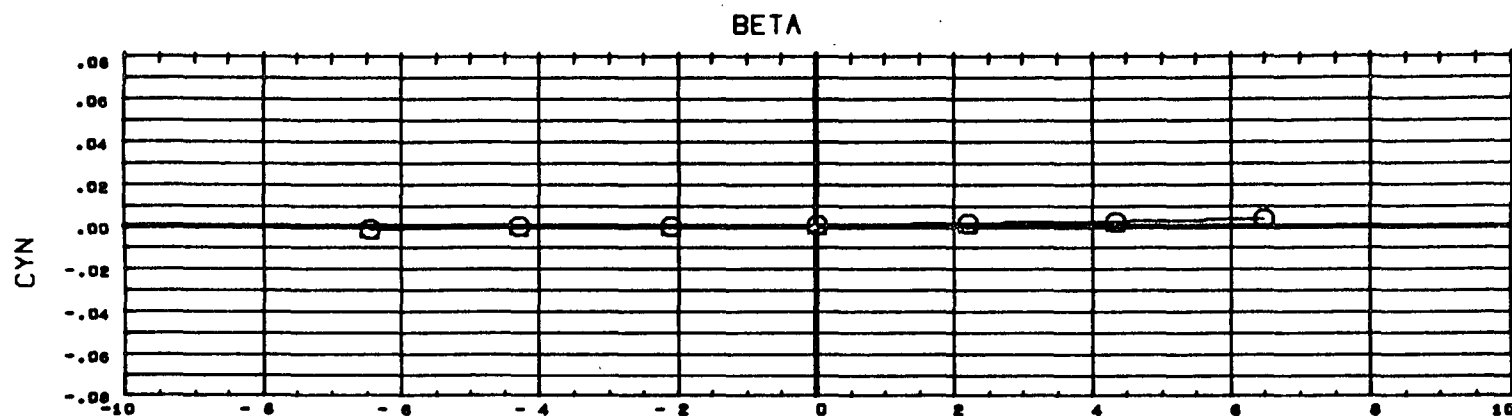
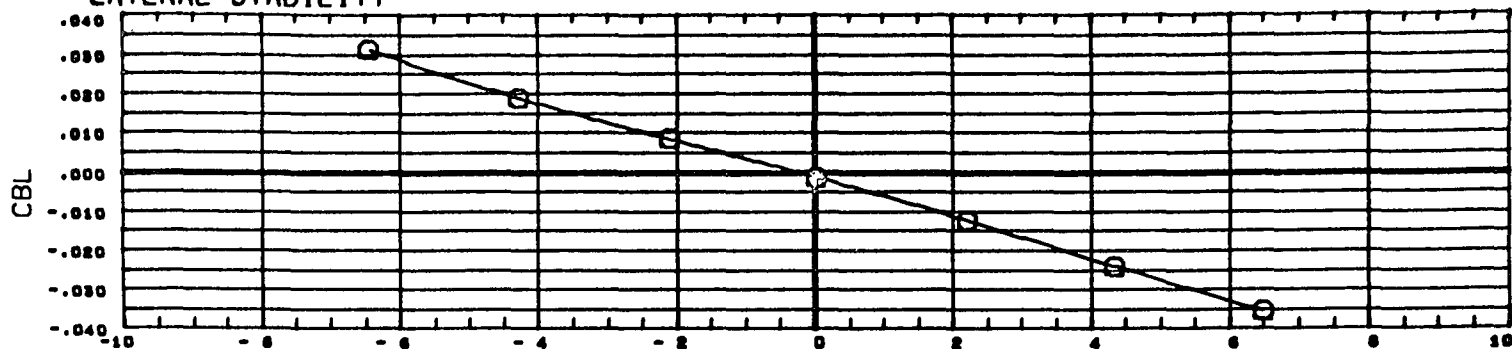
M513-MSFC MODELAR12161-2

B5CW11AF2S1E2V8

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LATERAL STABILITY



SYMBOL \bigcirc MACH 1.198 ALPHA 15.000 RUDDER 0.000
 RUDDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 30. IN.
 LREF 4.9080 IN.
 BREF 5.6590 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

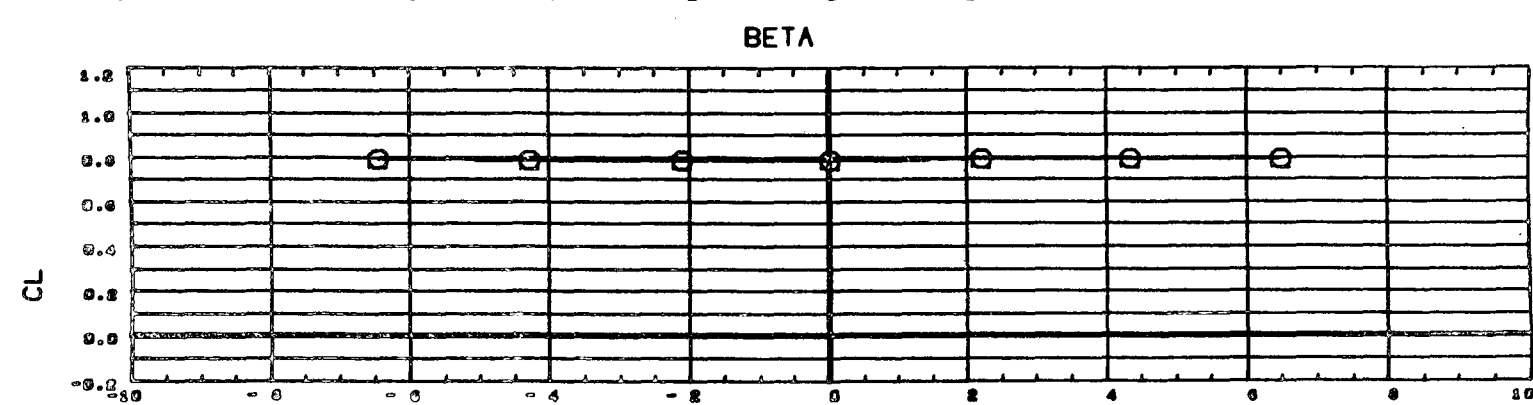
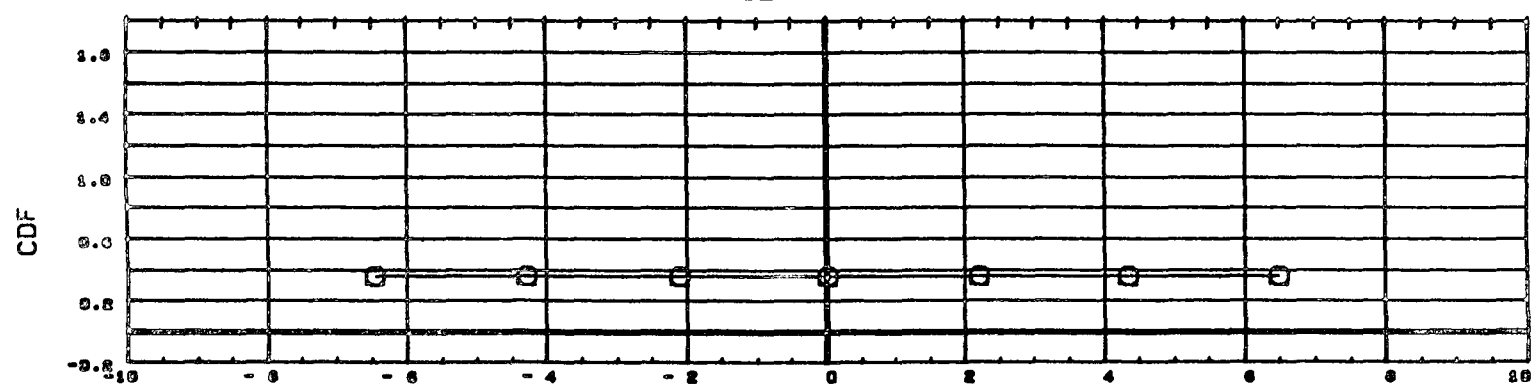
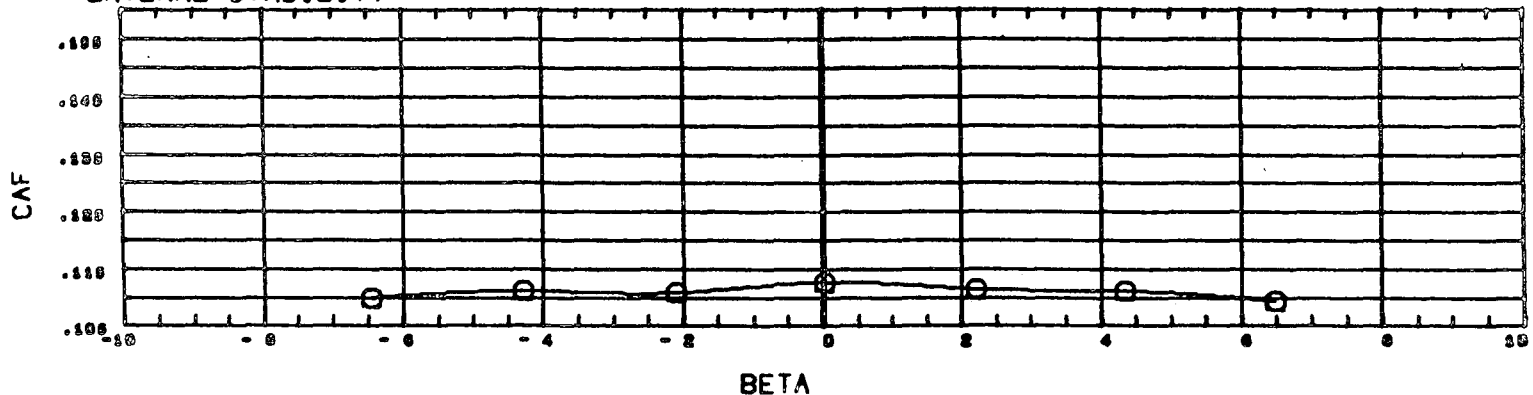
M513-MSFC MODELAR12161-2

B5CW11AF2S1E2V8

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LATERAL STABILITY

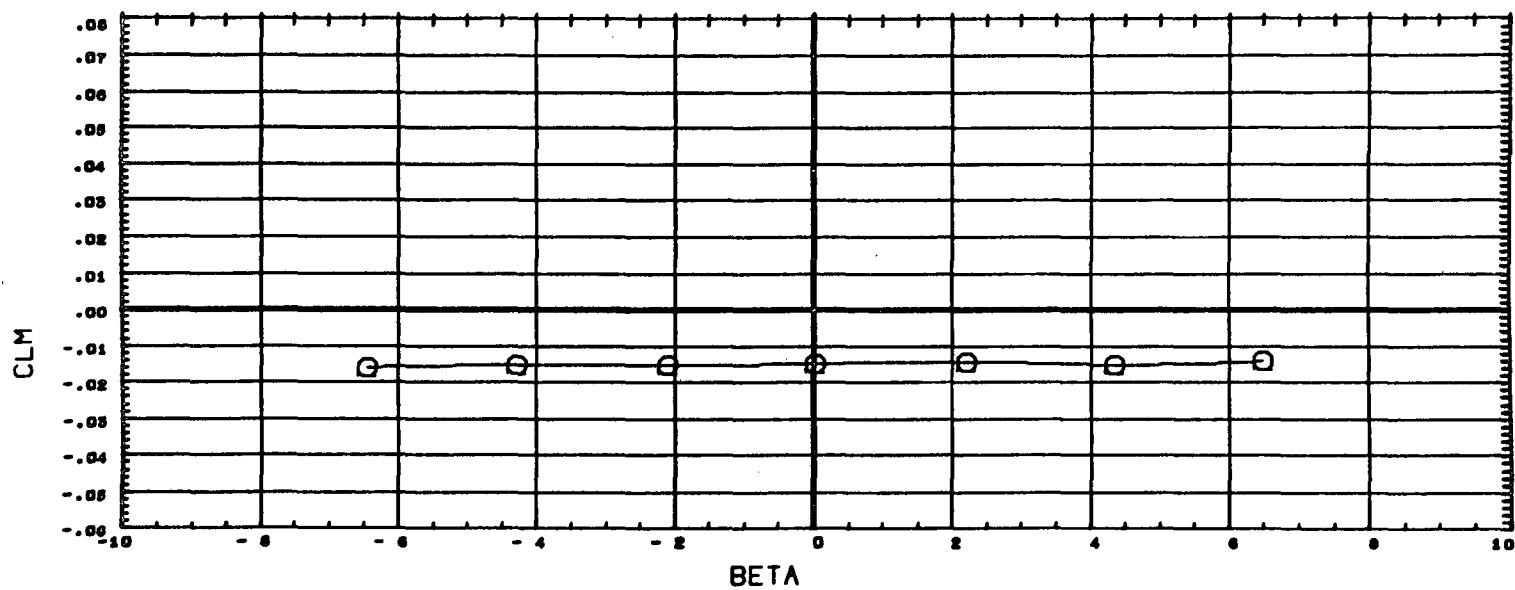
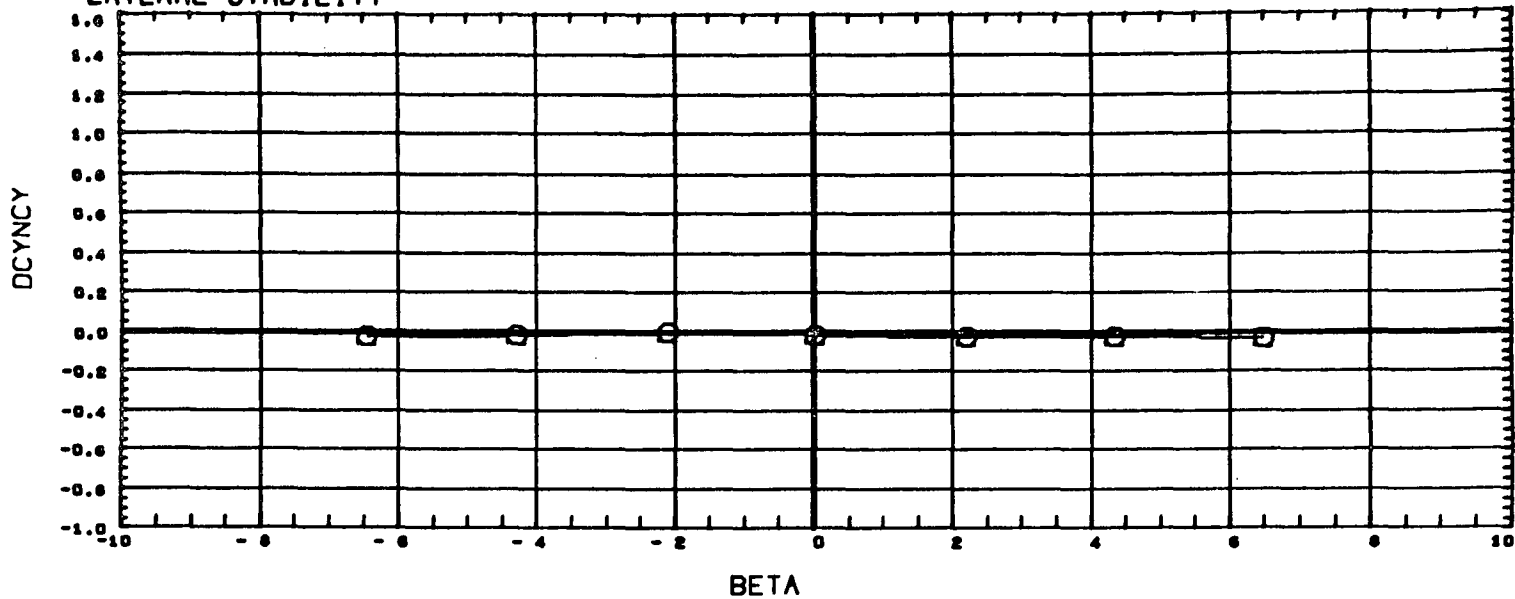


SYMBOL \square MACH 1.190
 PARAMETRIC VALUES
 ALPHA 15.000 RUDDER 0.000
 RUDDLR 30.000

REFERENCE INFORMATION
 SREF 14.6636 80. IN.
 LREF 4.5060 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

LATERAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 O 1.198 ALPHA 15.000 RUDDER 0.000
 RUDDLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 88. IN.
 LREF 4.9080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

M513-MSFC MODELAR12161-2

B5CW11AF2S1E2V8

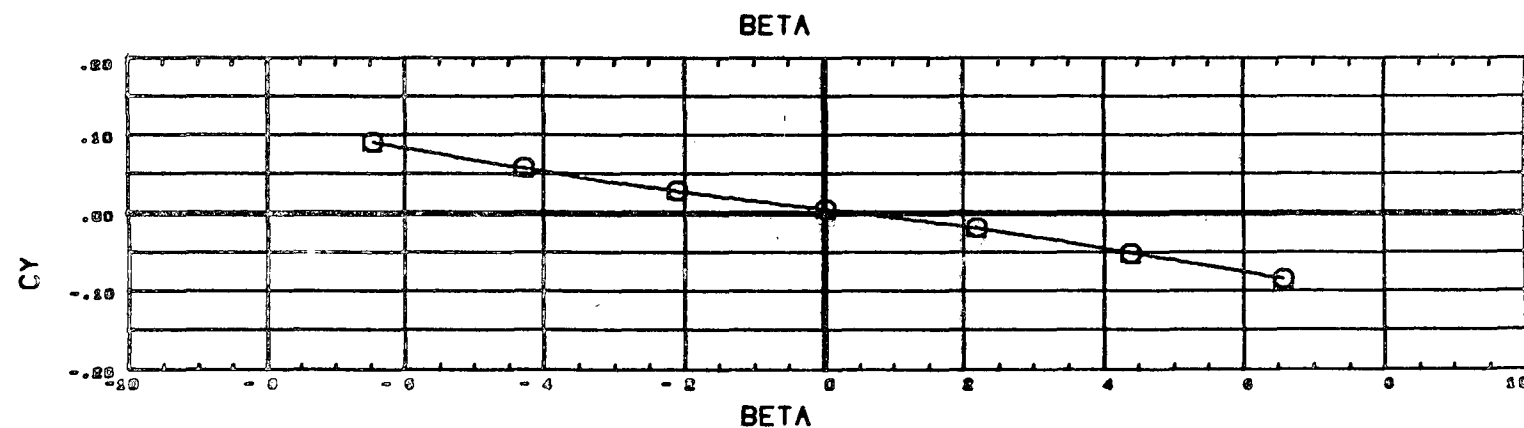
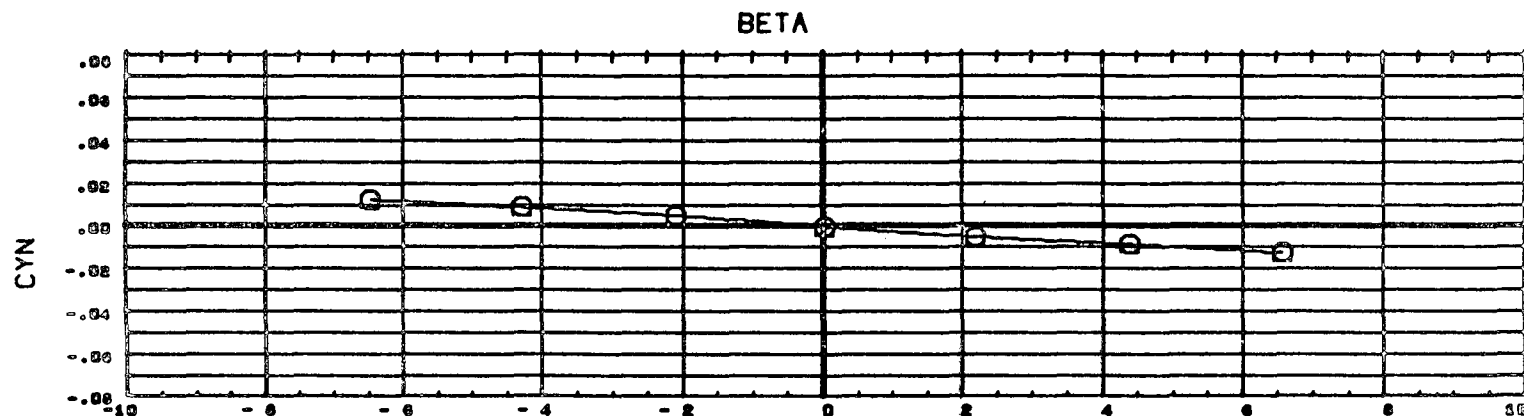
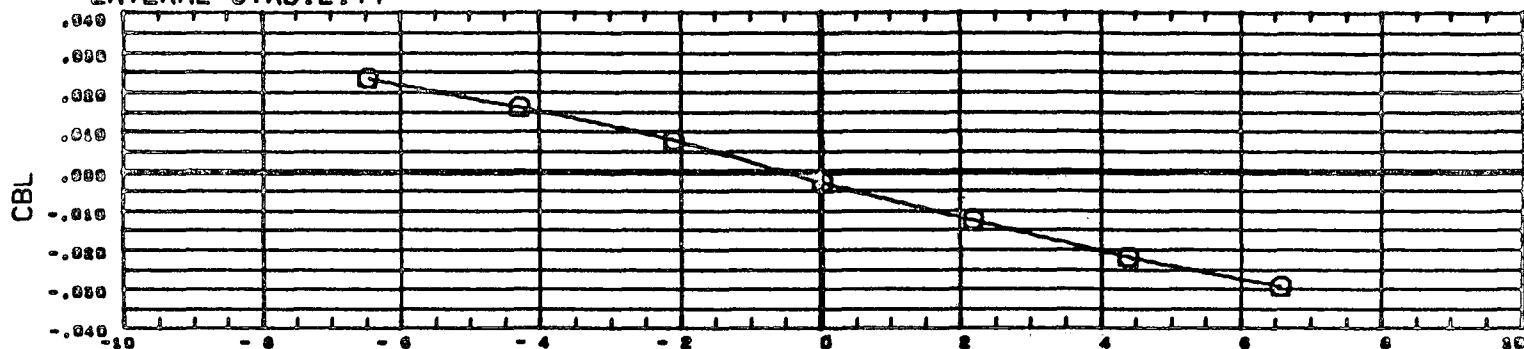
(C5311H)

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LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	1.900	ALPHA	25.000	RUDDER	0.000
		RUDDFLR	30.000		

REFERENCE INFORMATION		
SREF	14.6850	80. IN.
LREF	4.9000	IN.
BREF	5.6500	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0030	

DATA HIST. CODE 6C

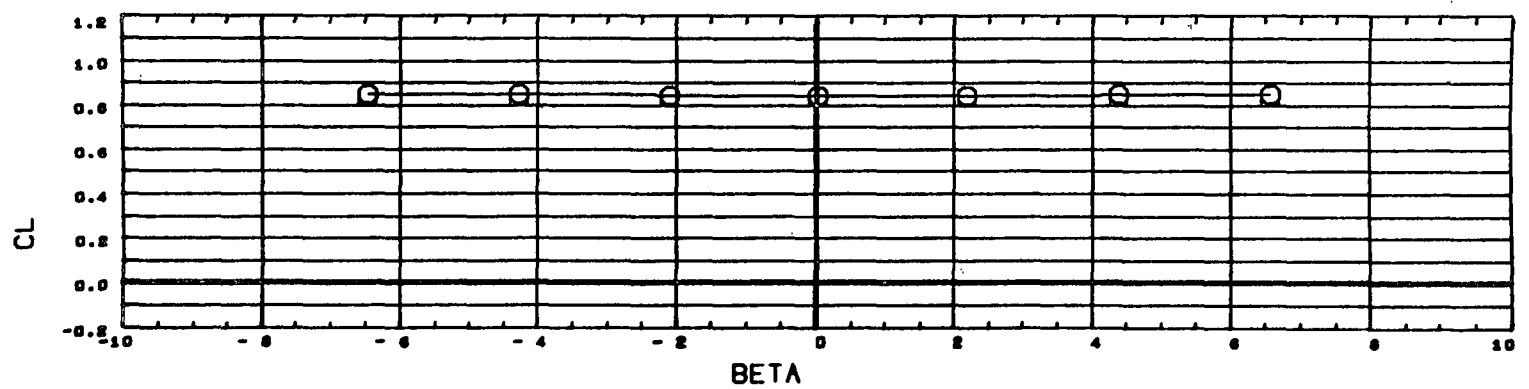
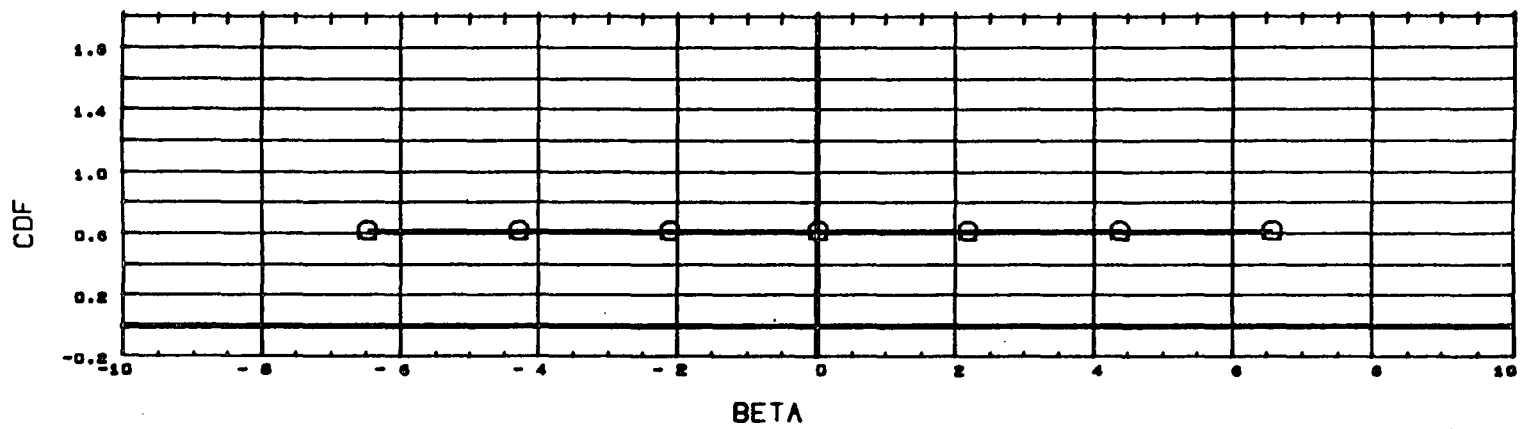
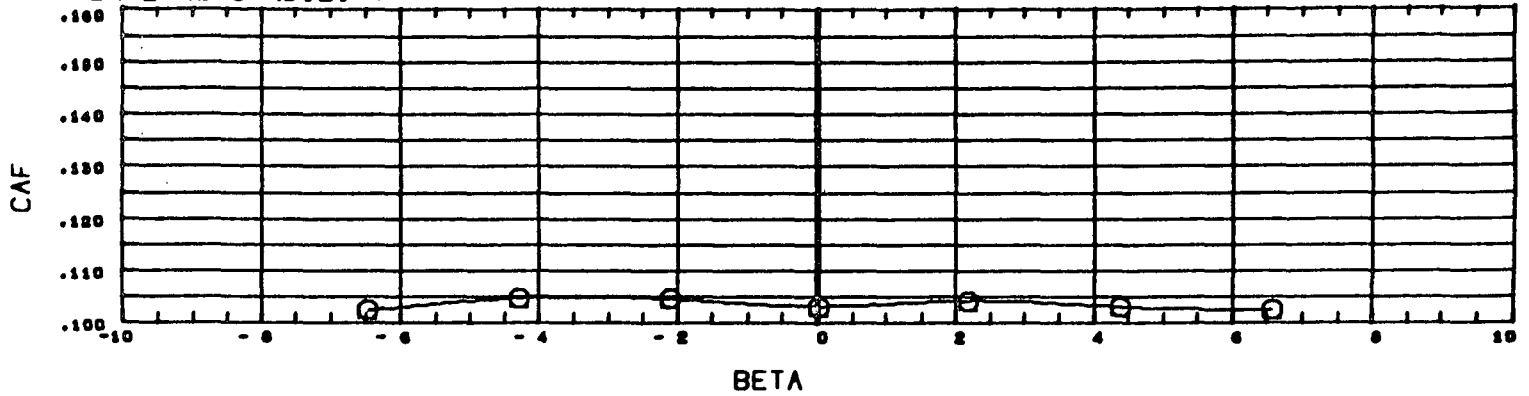
M513-MSFC MODELAR12161-2

B5CW11AF2S1E2V8

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LATERAL STABILITY



SYMBOL \square MACH 1.969 ALPHA 25.000 RUDDER 0.000
 RUDPLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 88. IN.
 LREF 4.5080 IN.
 BREF 5.6590 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

M513-MSFC MODELAR12161-2

B5CW11AF2S1E2V8

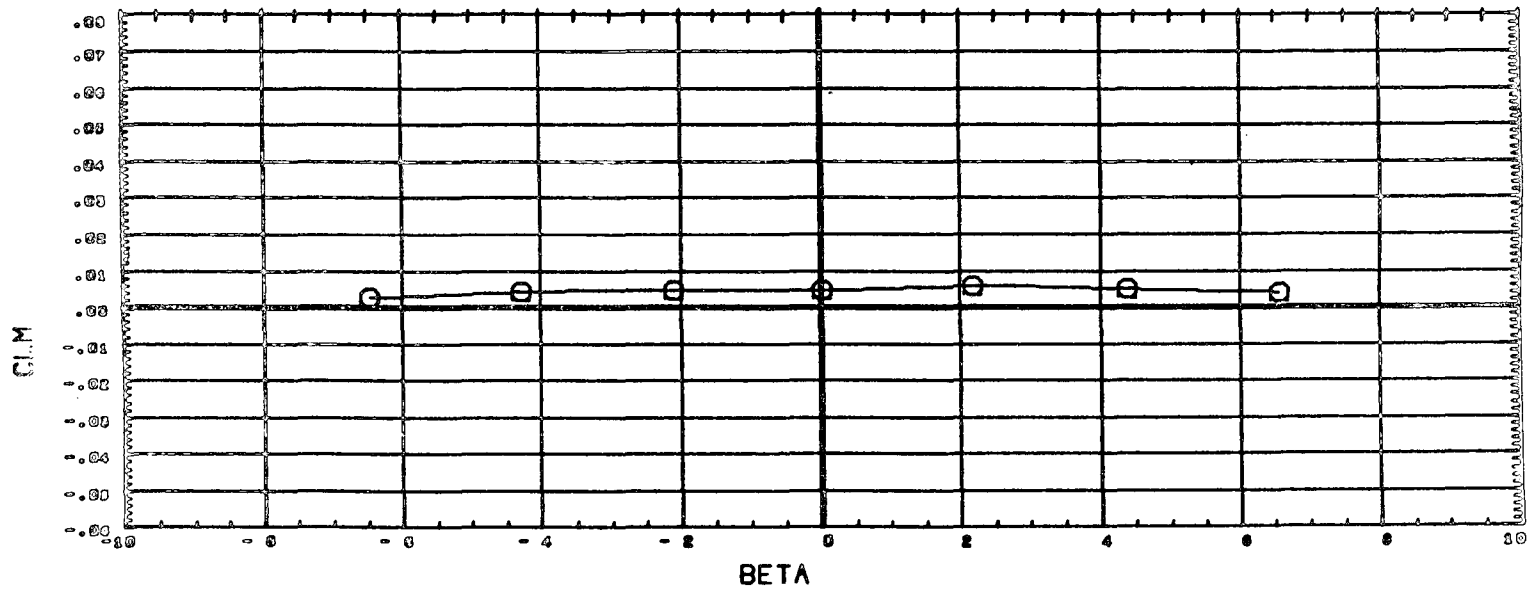
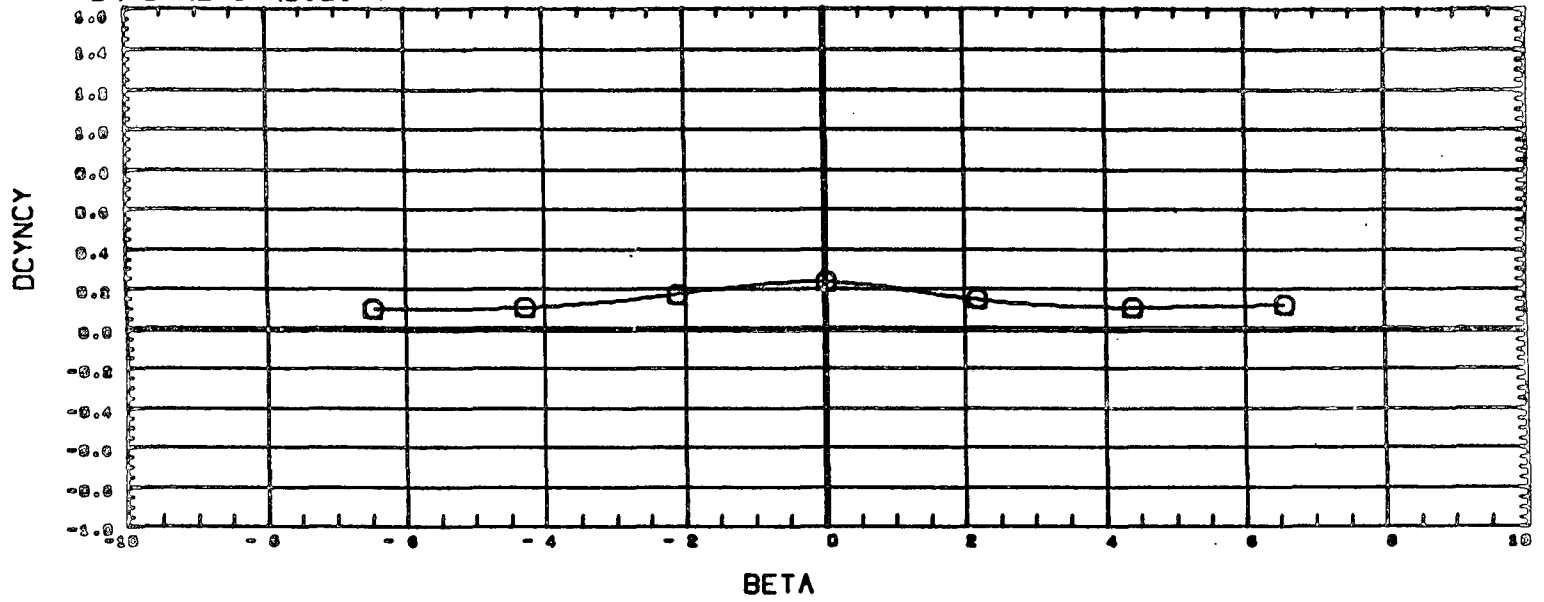
(C5311L)

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LATERAL STABILITY

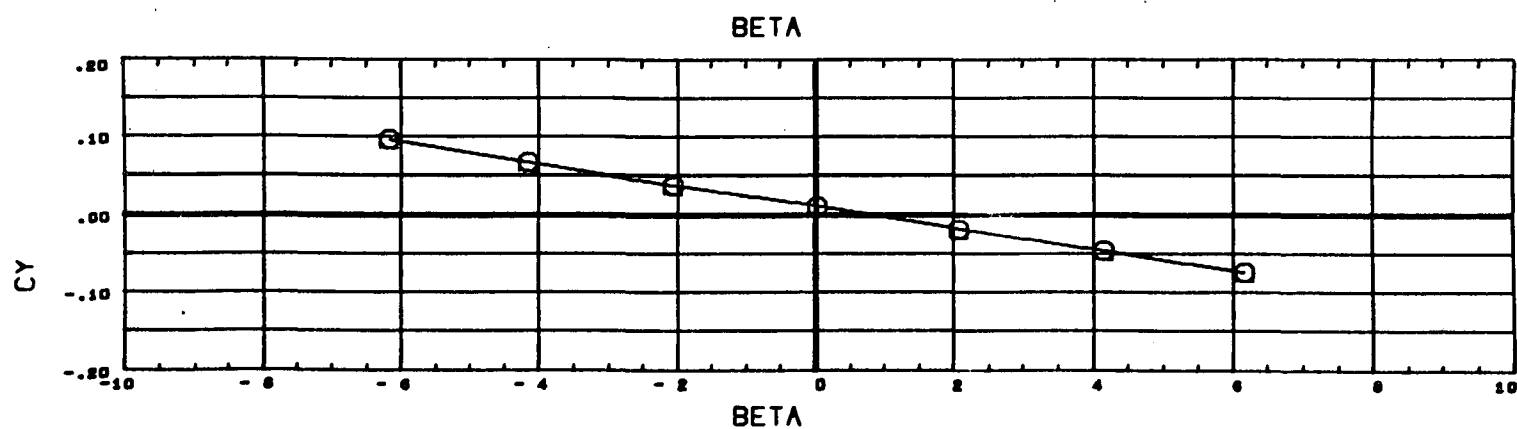
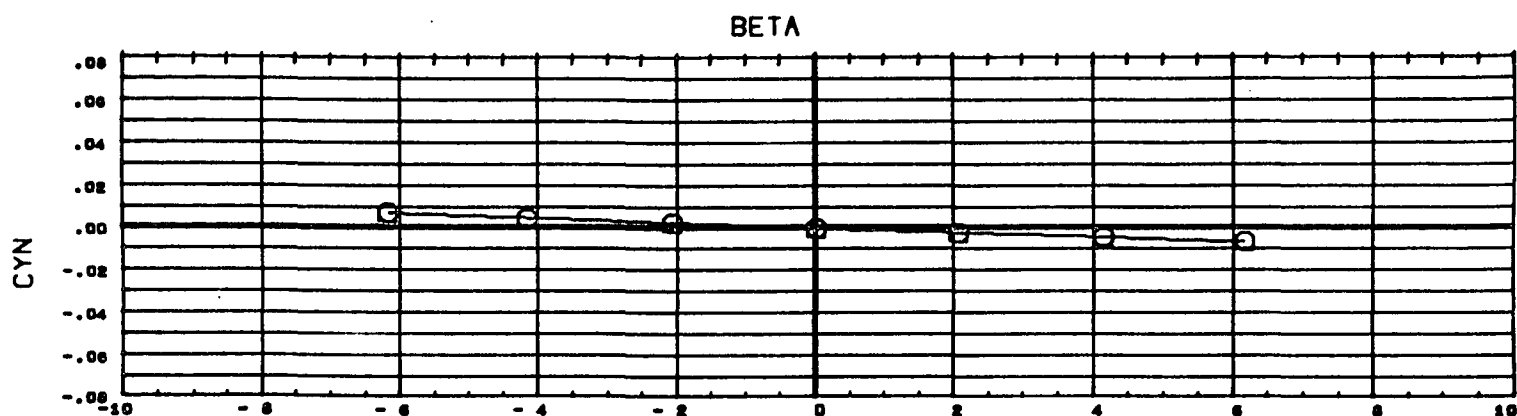
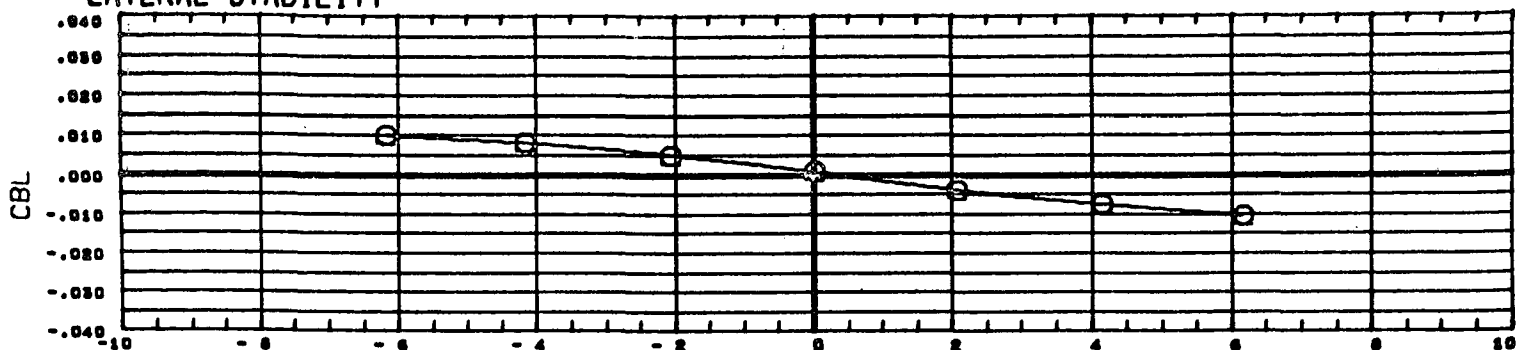


SYMBOL \square MACH 1.000
 PARAMETRIC VALUES
 ALPHA 29.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 BREF 14.6630 89. IN.
 LREF 4.8080 IN.
 DBEF 5.6550 IN.
 XMRP 1.4820 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 66

LATERAL STABILITY

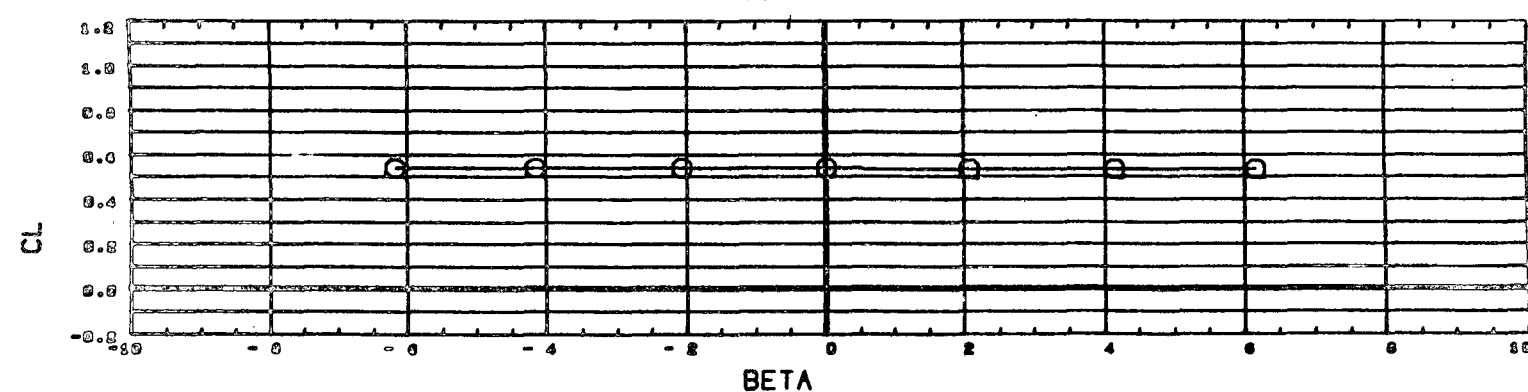
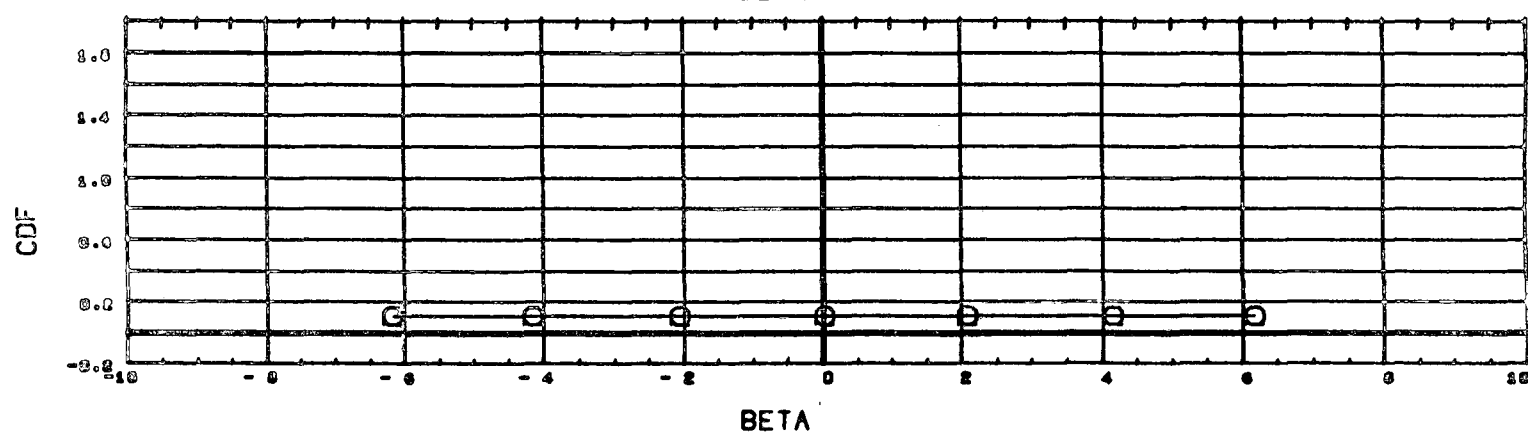
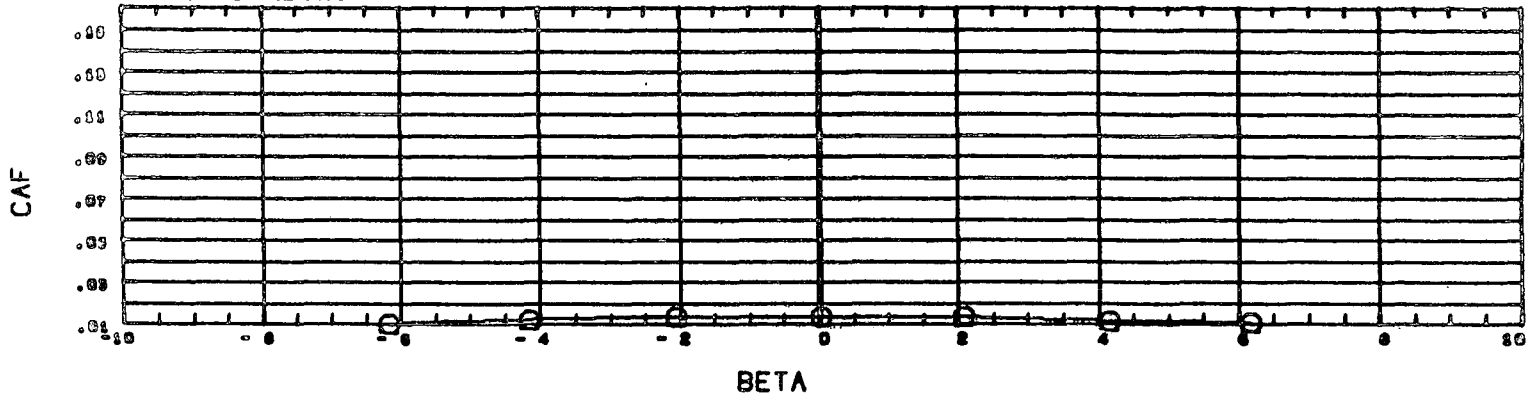


SYMBOL \bigcirc MACH 0.002 ALPHA 10.000 RUDDER 0.000
 RUDFLR 0.000

DATA MIST. CODE 6C

REFERENCE INFORMATION
 SREF 14.6836 88. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	0.002	ALPHA	10.000	RUDDER	0.000
		RUDDLR	0.000		

REFERENCE INFORMATION		
BREF	14.0036	89. IN.
LREF	4.5000	IN.
BREF	5.0550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE 6C

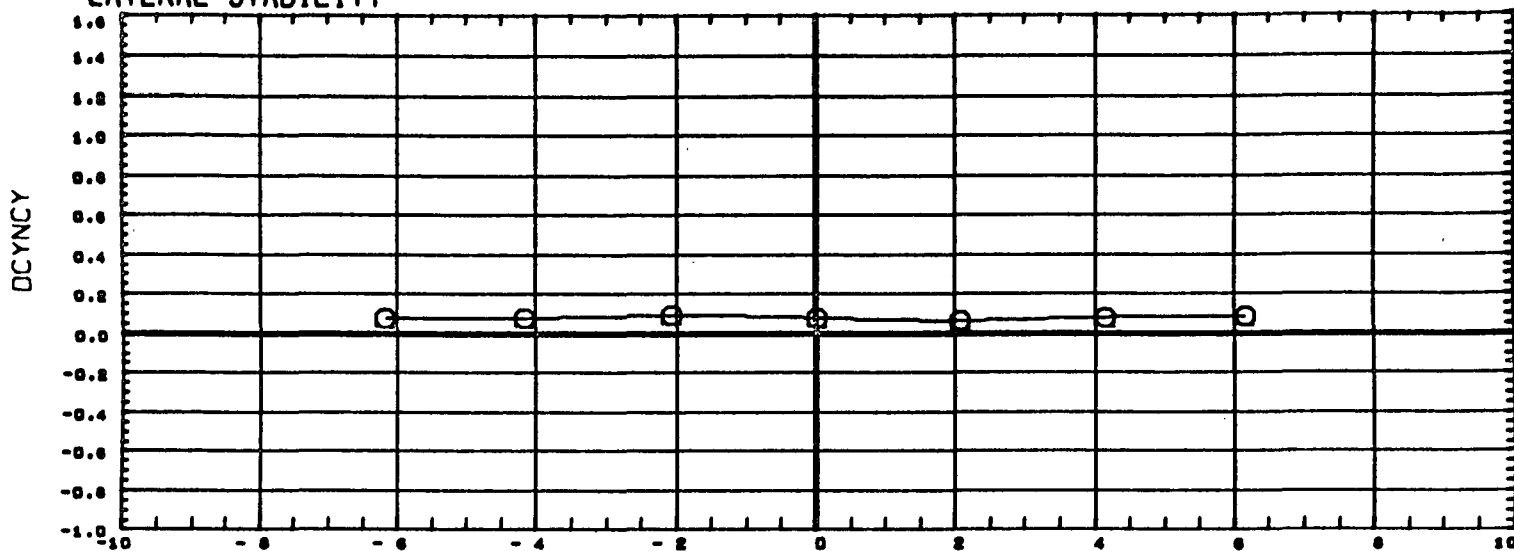
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B5CW11AF2S1E2V9

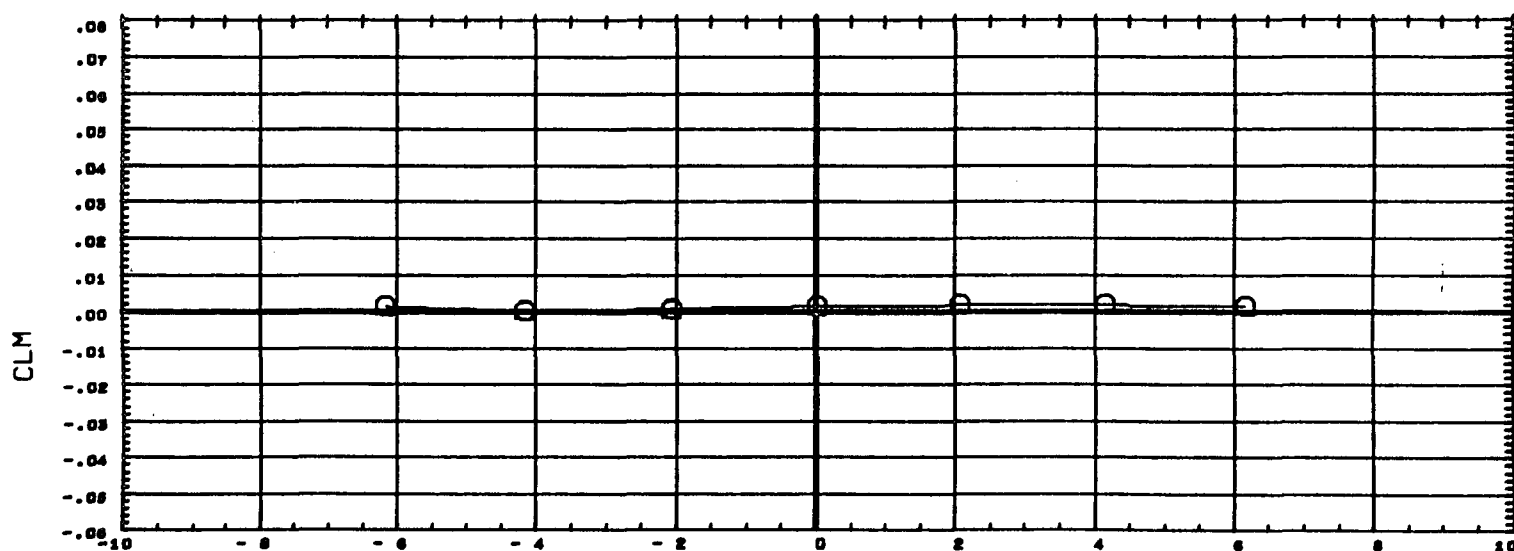
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LATERAL STABILITY



BETA



BETA

SYMBOL \square MACH 0.002
 PARAMETRIC VALUES
 ALPHA 10.000 RUDDER 0.000
 RUDDLR 0.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

M513-MSFC MODELAR1216I-2

B5CW11AF2S1E2V9

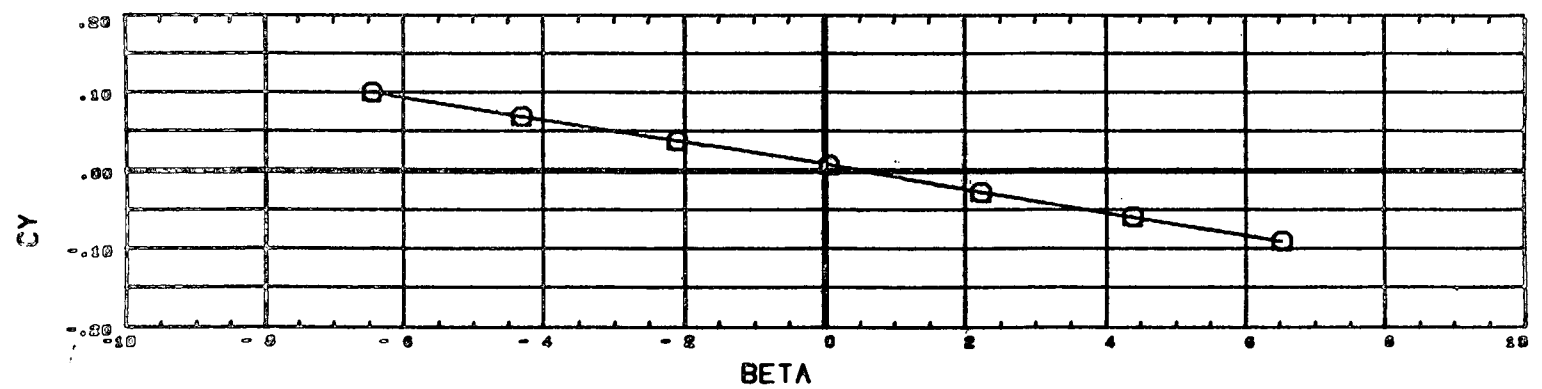
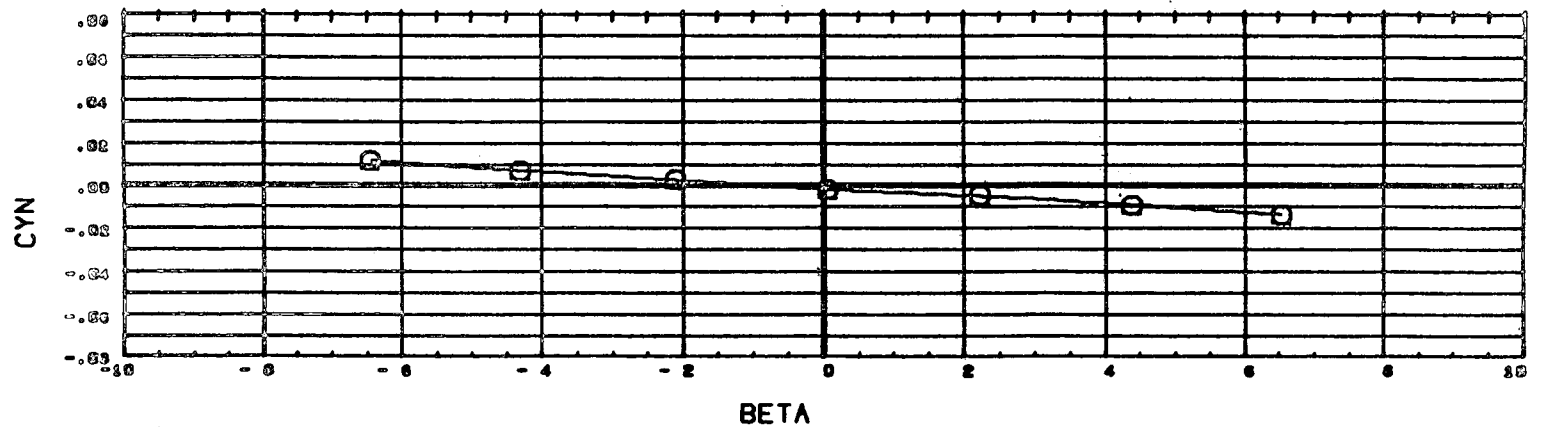
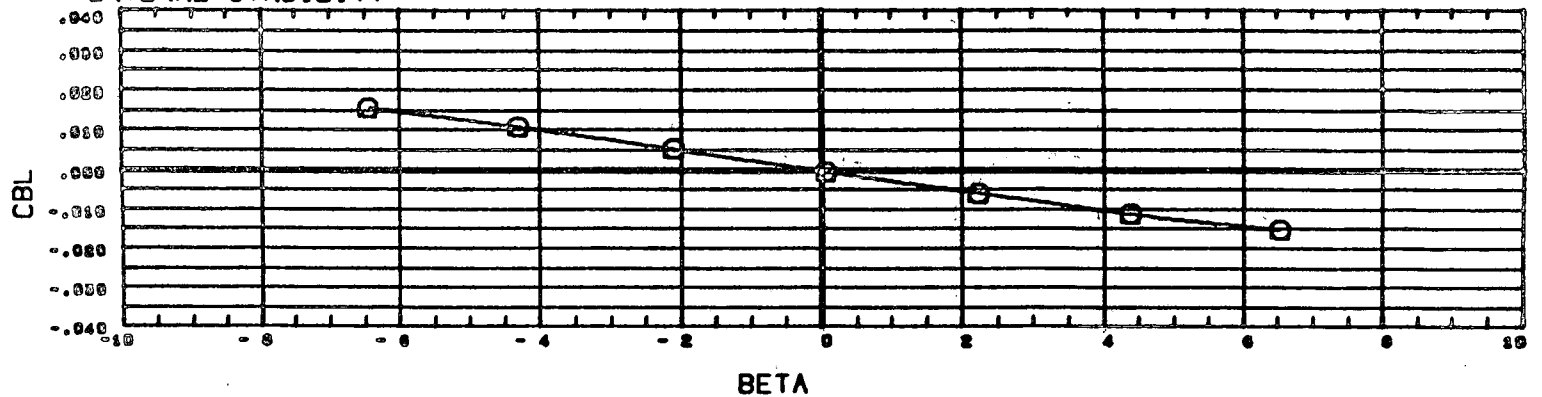
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LATERAL STABILITY



SYMBOL \square MACH 0.201
 PARAMETRIC VALUES
 ALPHA 15.000 RUDDER 0.000
 RUDDFLR 0.000

REFERENCE INFORMATION
 SREF 14.6036 SQ. IN.
 LREF 4.5060 IN.
 SREF 5.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

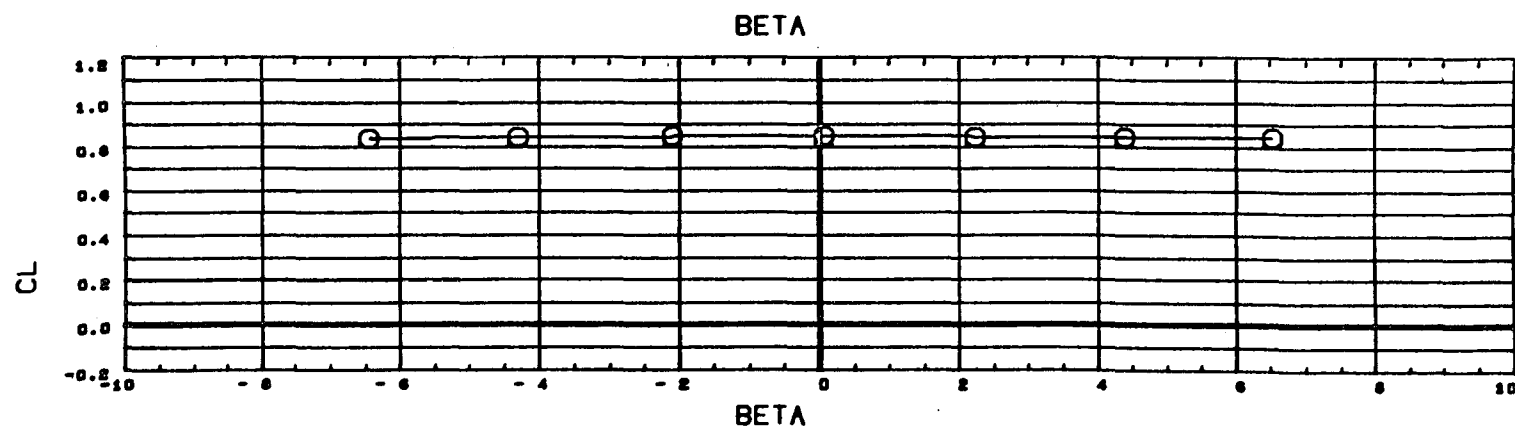
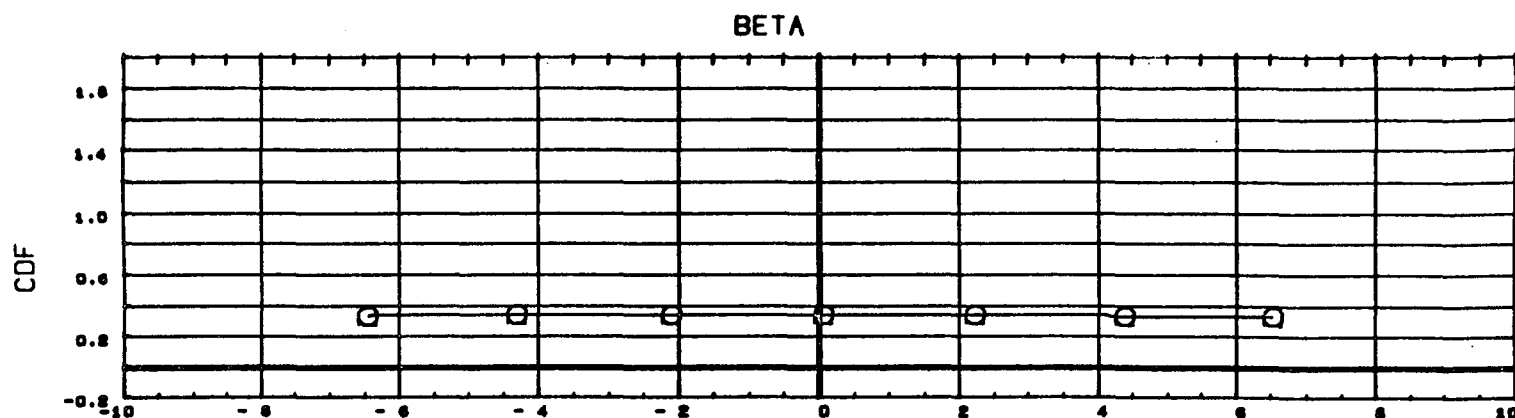
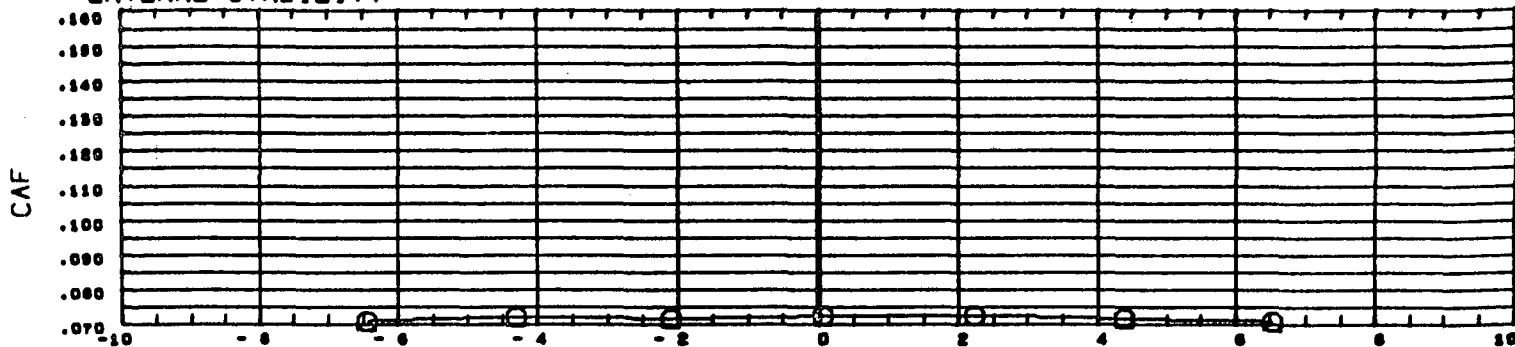
M513-MSFC MODELAR12161-2

B5CW11AF2S1E2V9

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LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
○	1.201	ALPHA	15.000	RUDDER 0.000
		RUDPLR	0.000	

REFERENCE INFORMATION		
BREF	14.6636	88. IN.
LREF	4.9080	IN.
BREF	5.6550	IN.
XHRP	1.4821	IN.
YHRP	0.0000	IN.
ZHRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE 6C

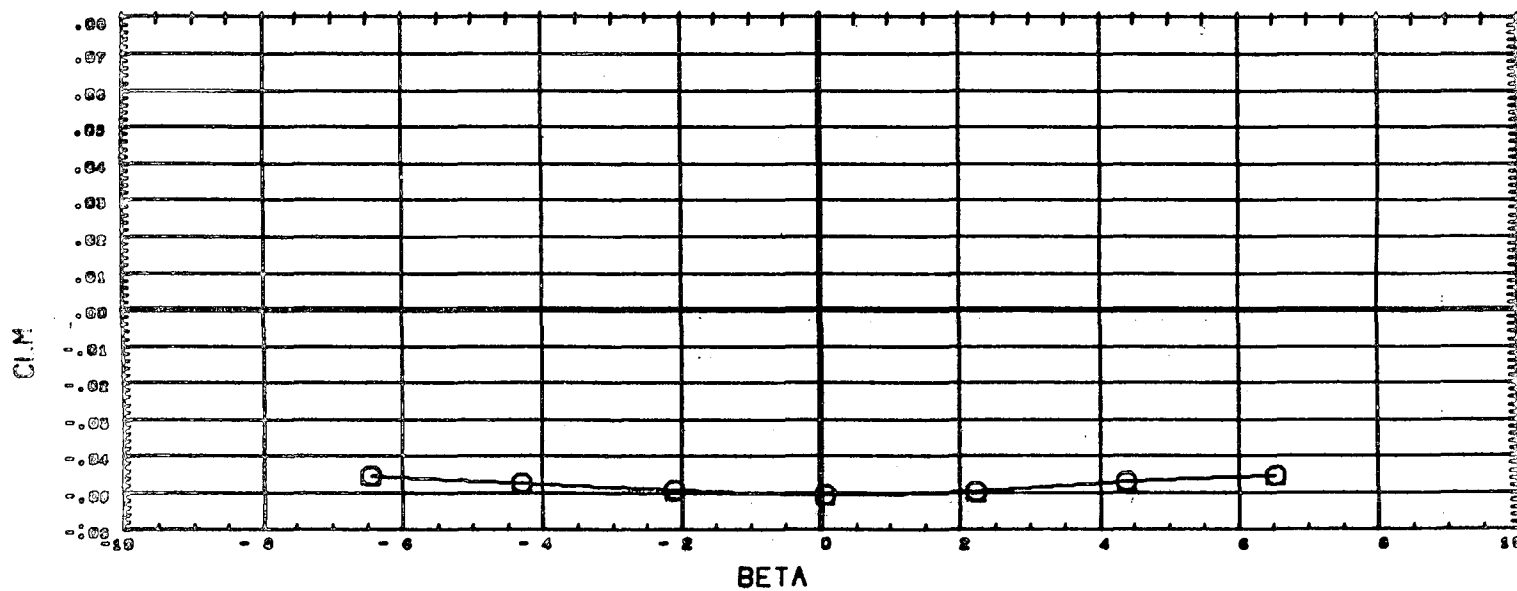
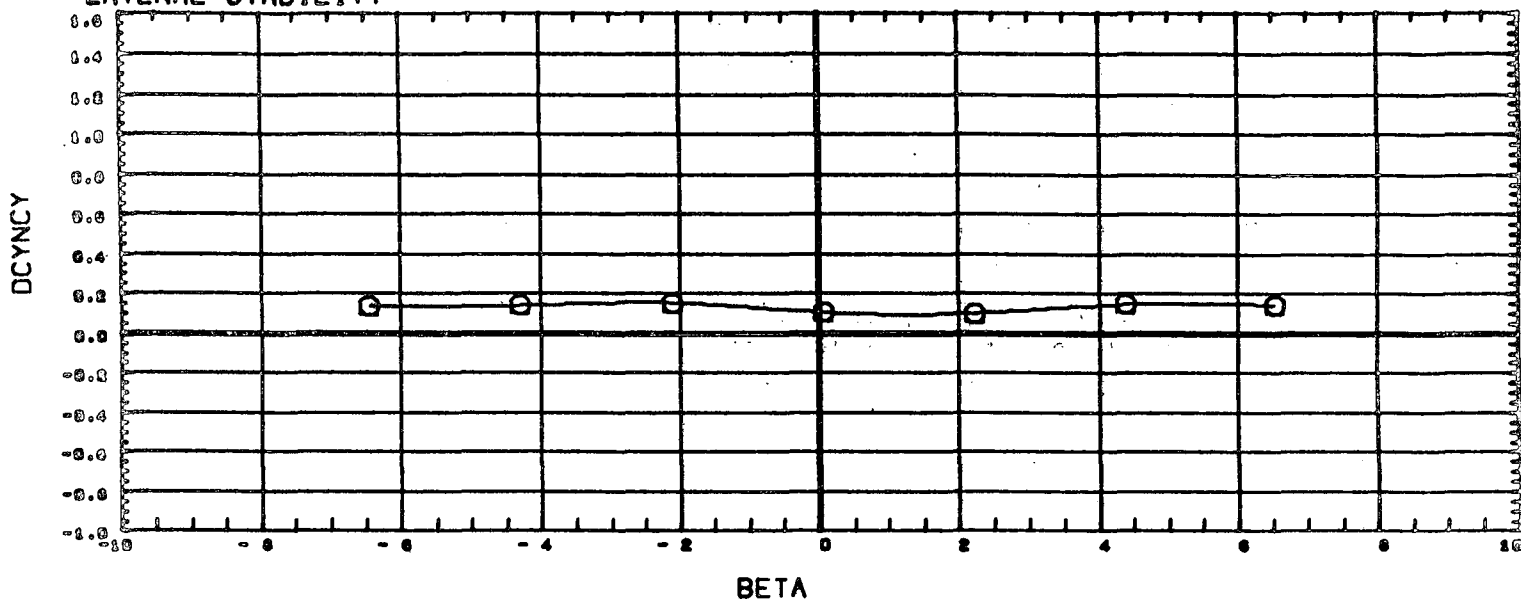
M513-MSFC MODELAR1216I-2

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LATERAL STABILITY



SYMBOL \square HACH 1.201
 PARAMETRIC VALUES
 ALPHA 15.000 RUDDER 0.000
 RUDDLR 0.000

REFERENCE INFORMATION
 SREF 14.6636 88. IN.
 LREF 4.5080 IN.
 SREF 5.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

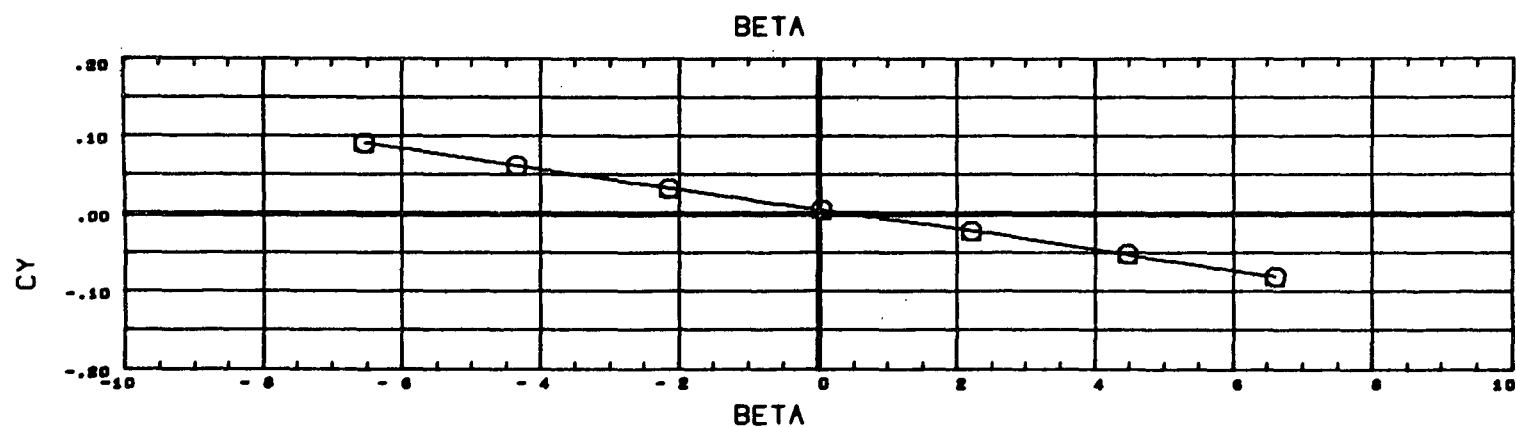
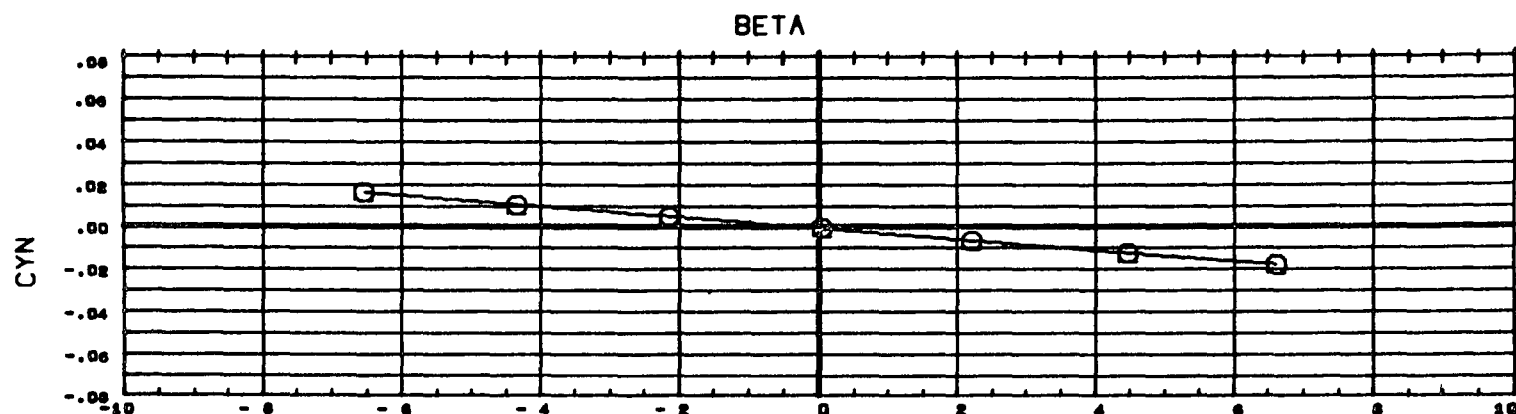
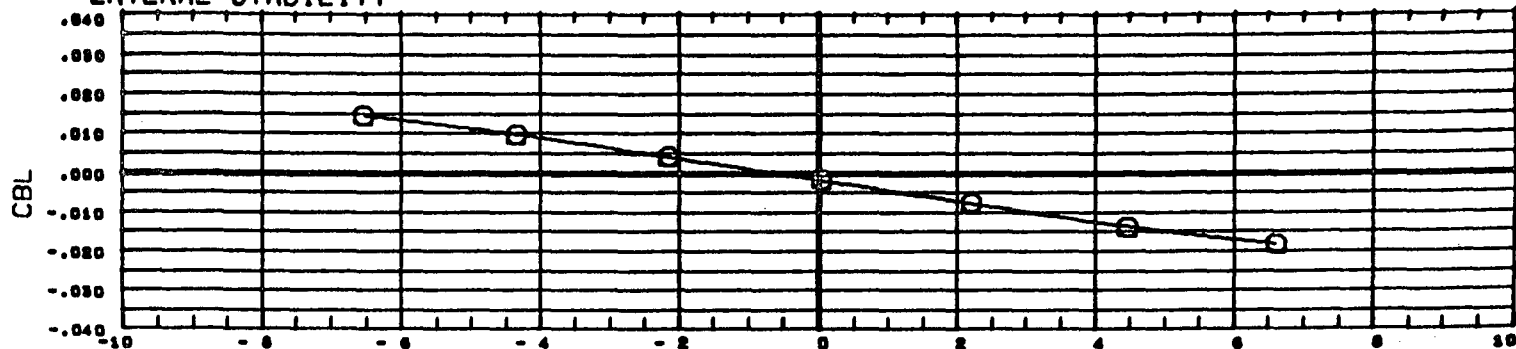
M513-MSFC MODELAR12161-2

B5CW11AF2S1E2V9

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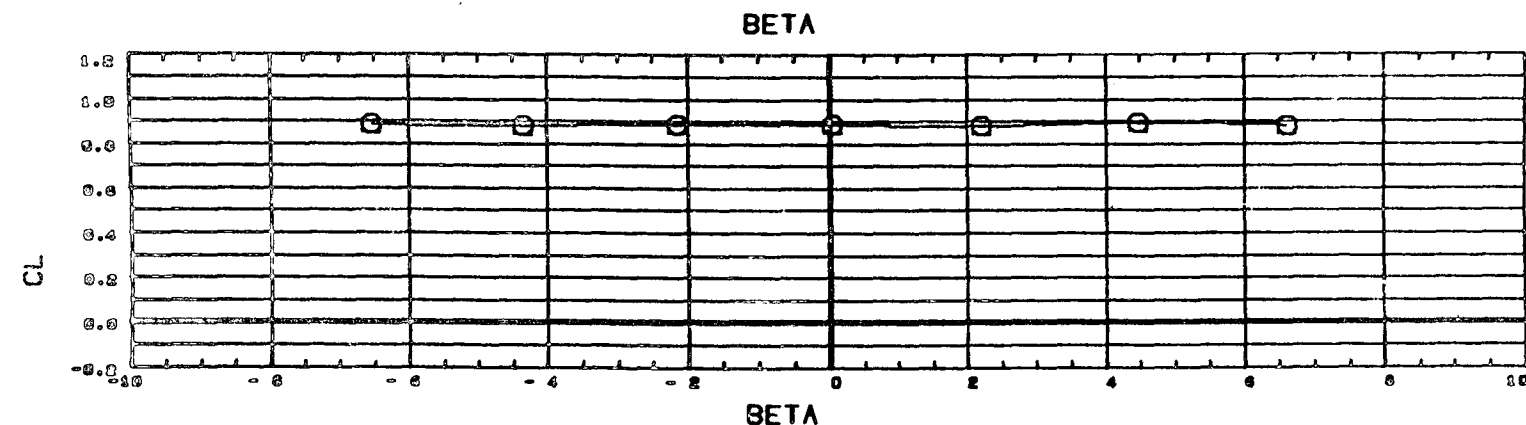
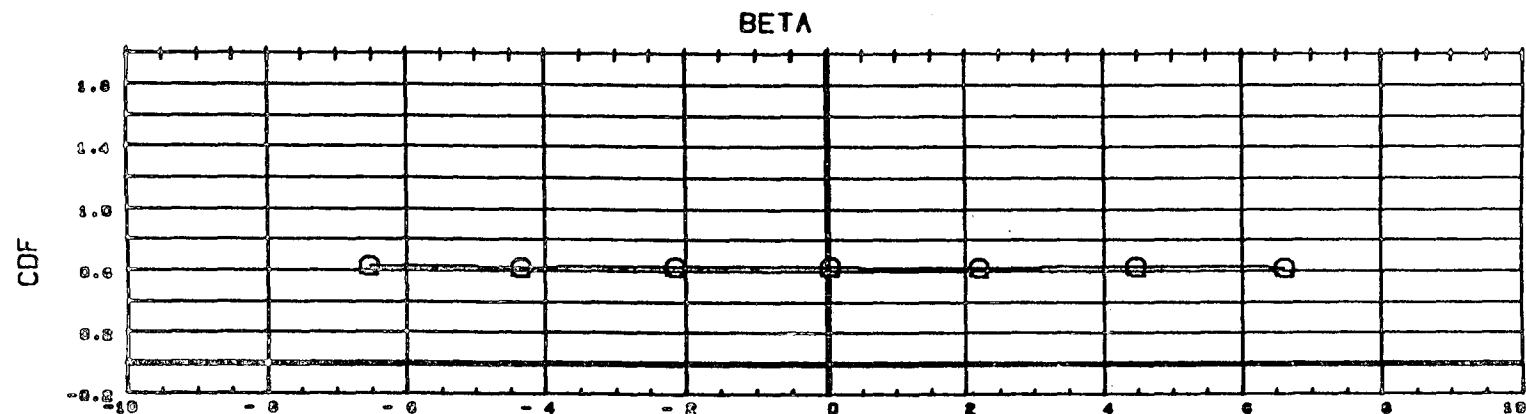
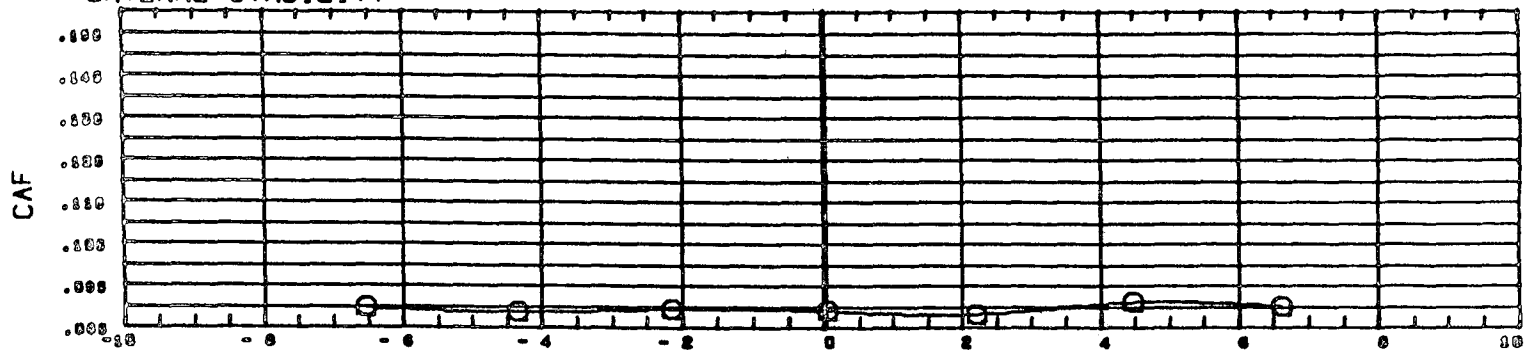


SYMBOL \square MACH 1.967 ALPHA 25.000 RUDDER 0.000
 RUDFLR 0.000

DATA HIST. CODE 6C

REFERENCE INFORMATION
 SREF 14.6636 88. IN.
 LREF 4.5060 IN.
 BREF 5.6550 IN.
 XNRP 1.4621 IN.
 YNRP 0.0000 IN.
 ZNRP 0.0000 IN.
 SCALE 0.0034

LATERAL STABILITY



SYMBOL \square MACH 1.007
 PARAMETRIC VALUES
 ALPHA 25.000 RUDDER 0.000
 RUDFLR 0.000

REFERENCE INFORMATION
 SREF 14.6836 30. IN.
 LREF 4.5080 IN.
 BREF 9.6550 IN.
 XMRP 1.4021 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

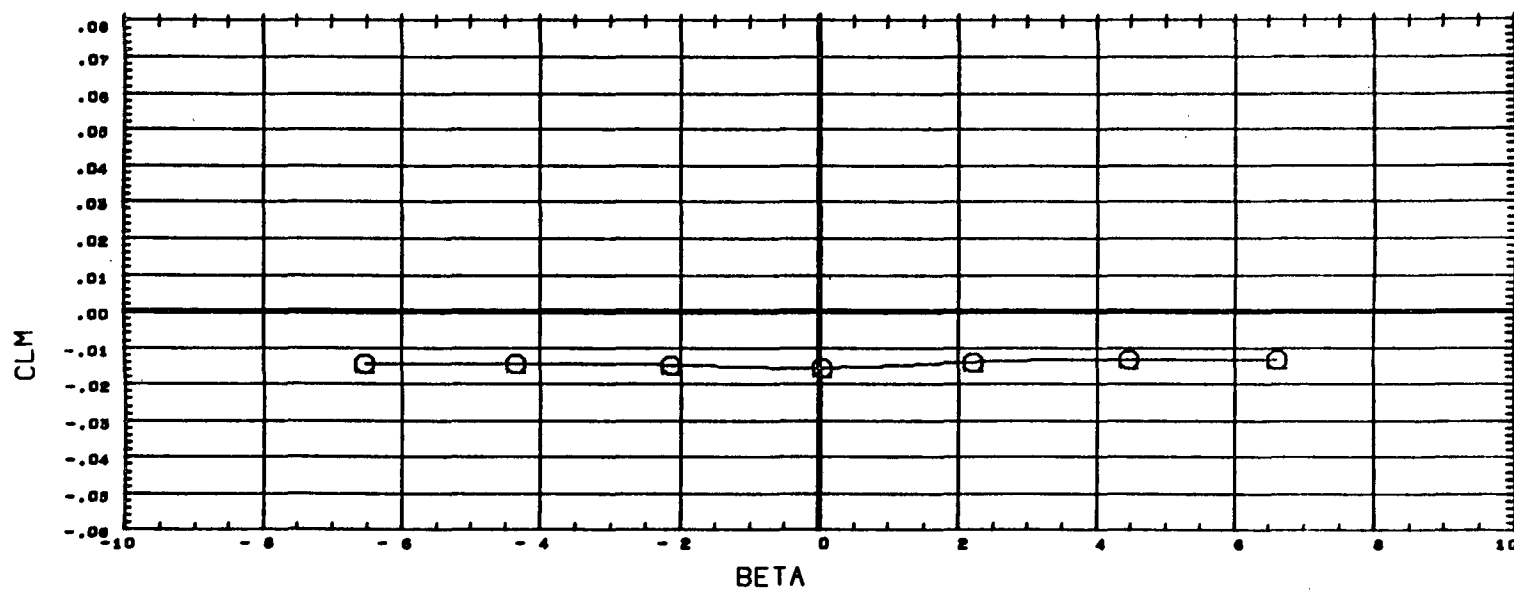
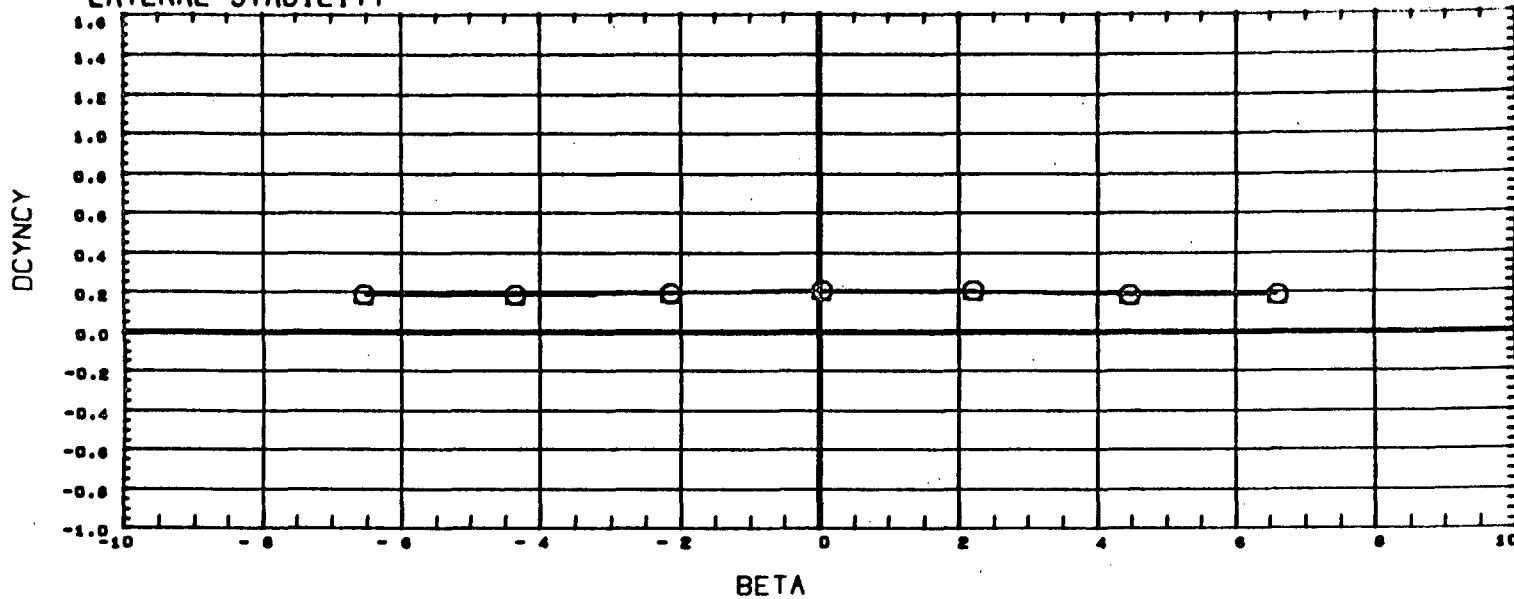
M513-MSFC MODELAR1216I-2

B5CW11AF2S1E2V9

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LATERAL STABILITY



SYMBOL \square MACH 1.967
 PARAMETRIC VALUES
 ALPHA 25.000 RUDDER 0.000
 RUDFLR 0.000

REFERENCE INFORMATION
 SREF 14.6836 sq. in.
 LREF 4.5080 in.
 BREF 5.6550 in.
 XMRP 1.4821 in.
 YMRP 0.0000 in.
 ZMRP 0.0000 in.
 SCALE 0.0034

DATA HIST. CODE GC

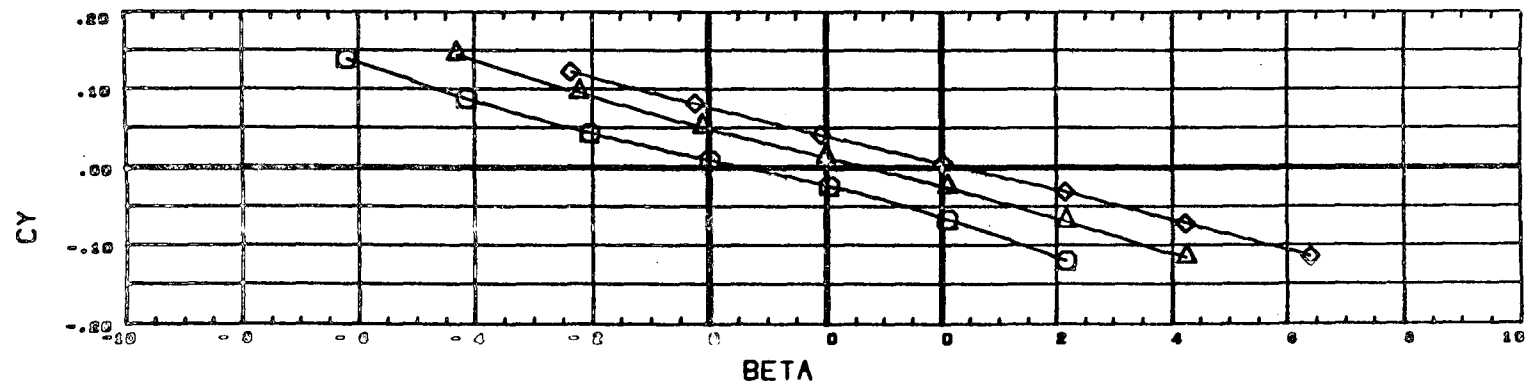
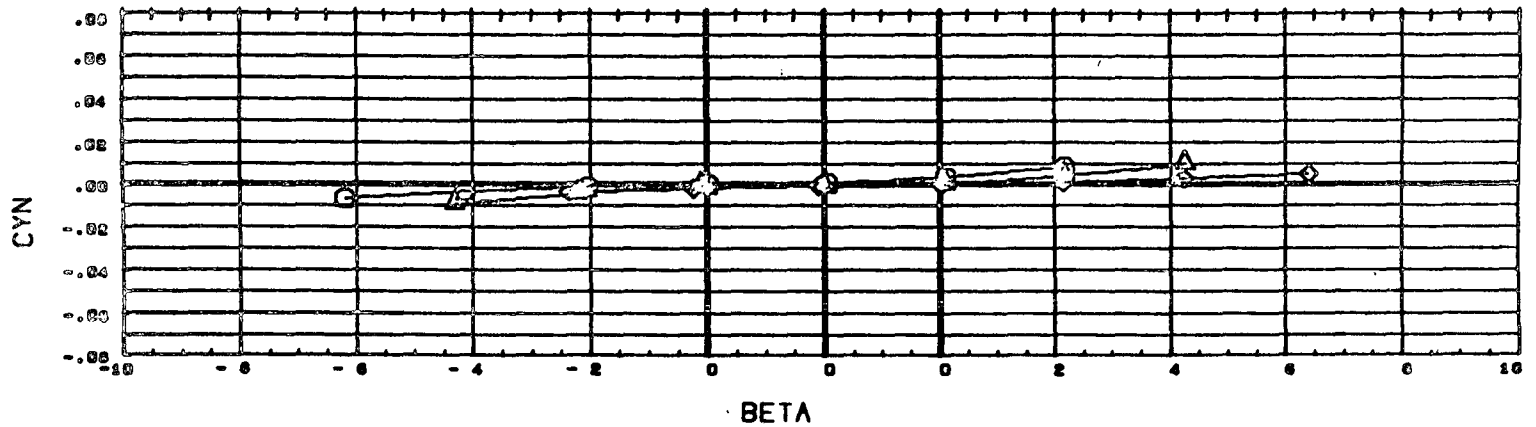
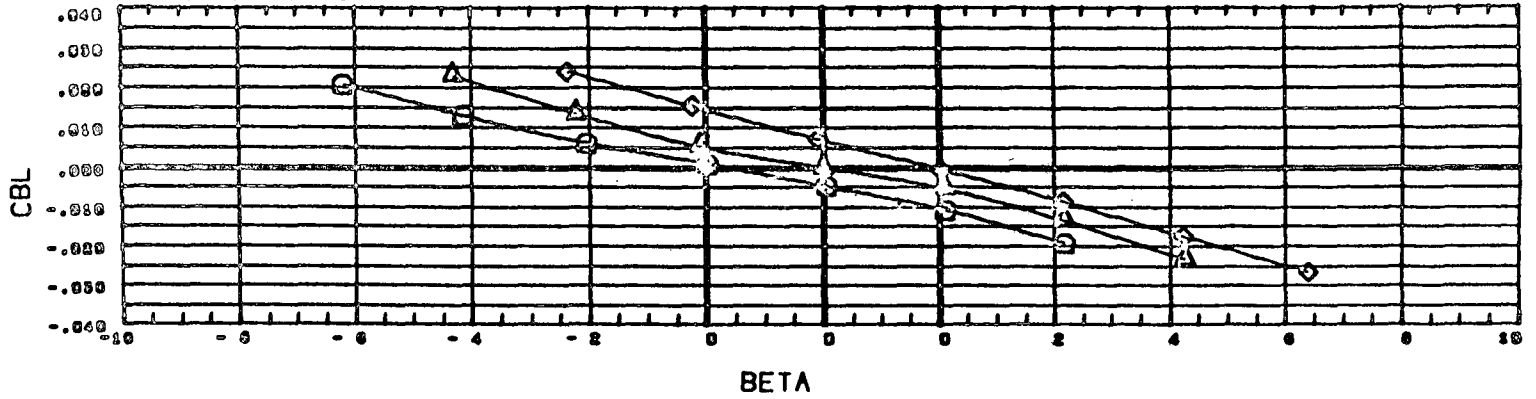
M513-MSFC MODELAR12161-2

B5CW11AF2S1E2V9

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LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES
○	0.001	ALPHA 10.000 RUDDER 0.000
△	0.002	RUDFLR 30.000
◇	0.300	

REFERENCE INFORMATION		
SREF	14.6636	89. IN.
LREF	4.5000	IN.
BREF	0.6550	IN.
XNRP	1.4621	IN.
YNRP	0.0000	IN.
ZNRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

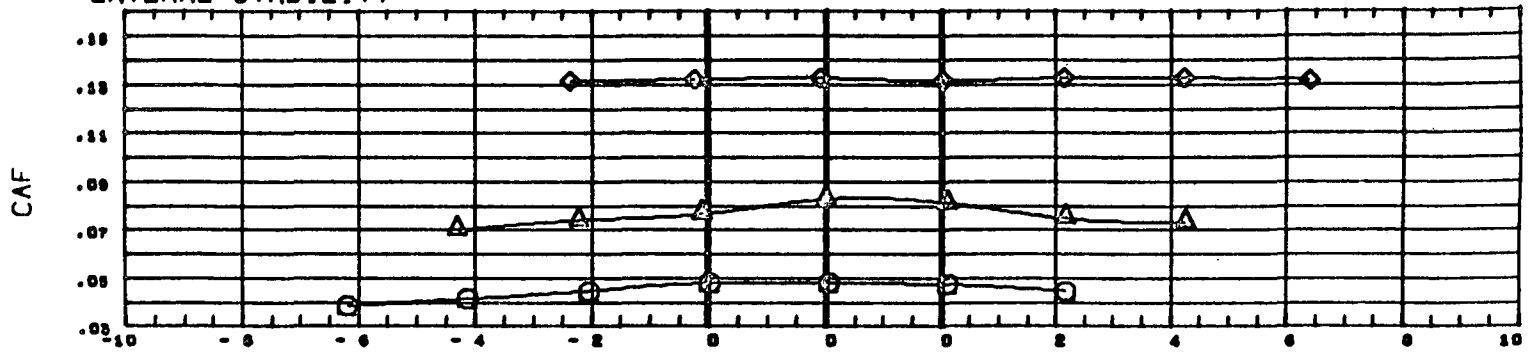
M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E3

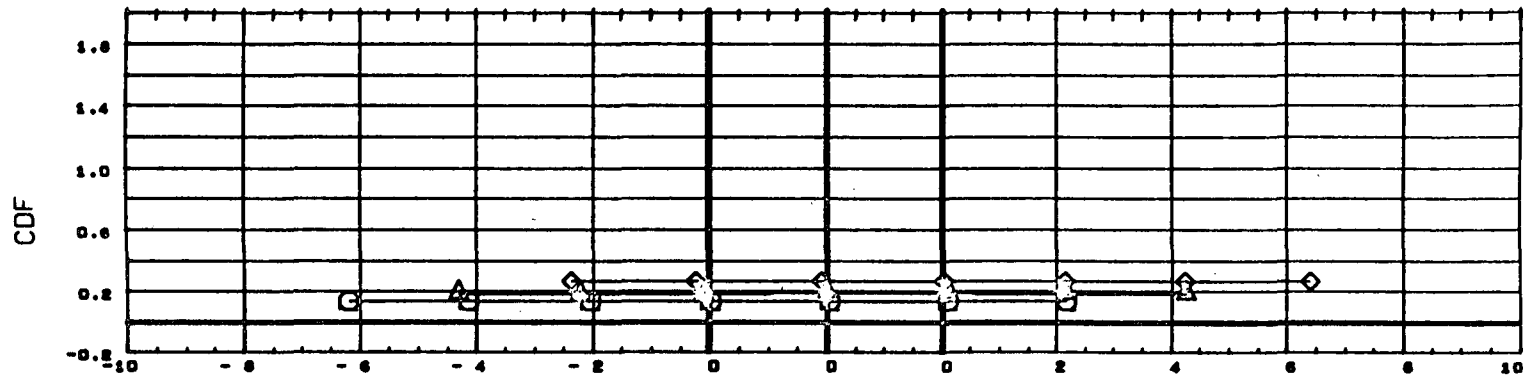
(C5309G) 18 MAR 72

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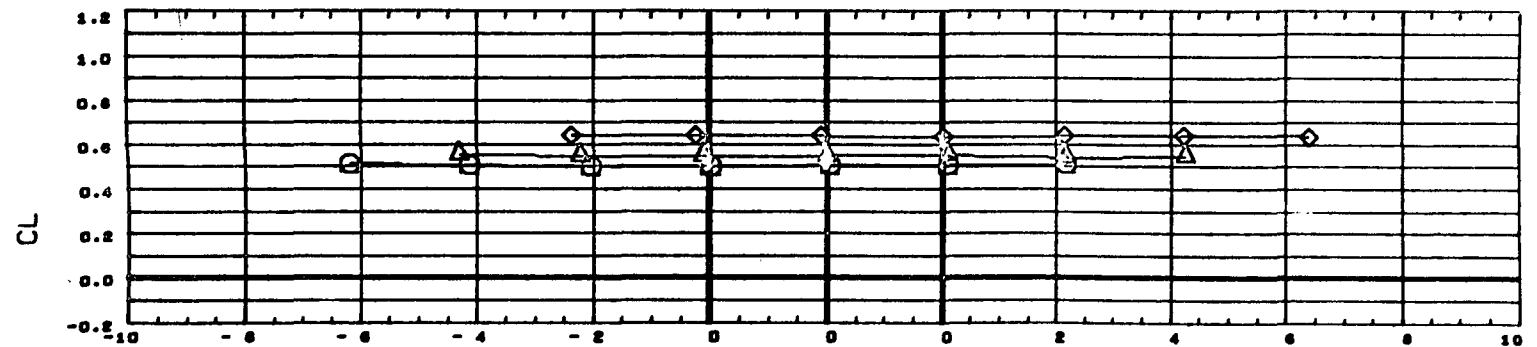
LATERAL STABILITY



BETA



BETA



BETA

SYMBOL	MACH	PARAMETRIC VALUES
○	0.601	ALPHA 10.000 RUDDER 0.000
△	0.902	RUDFLR 30.000
◇	1.198	

REFERENCE INFORMATION		
SREF	14.6836	89 IN.
LREF	4.9080	IN.
BREF	9.6550	IN.
XMRP	1.4021	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

M513-MSFC MODELAR1216I-2

B5CW11AF2S1V7E3

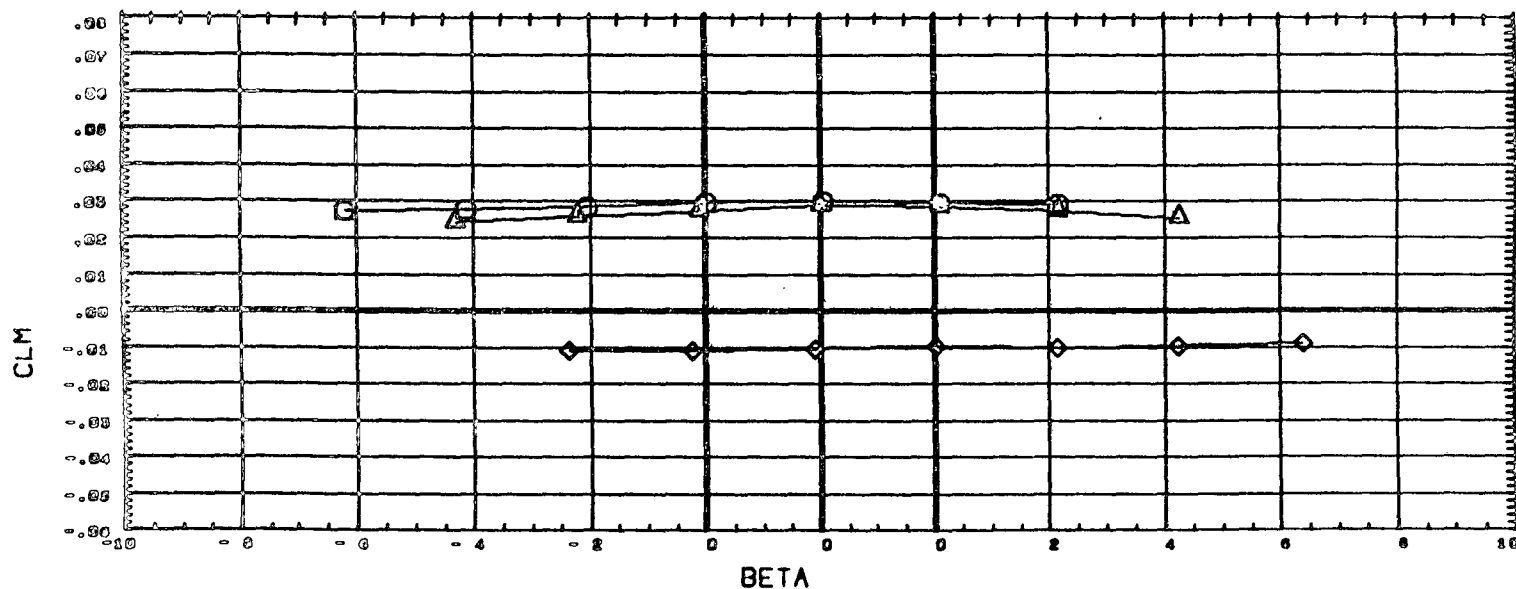
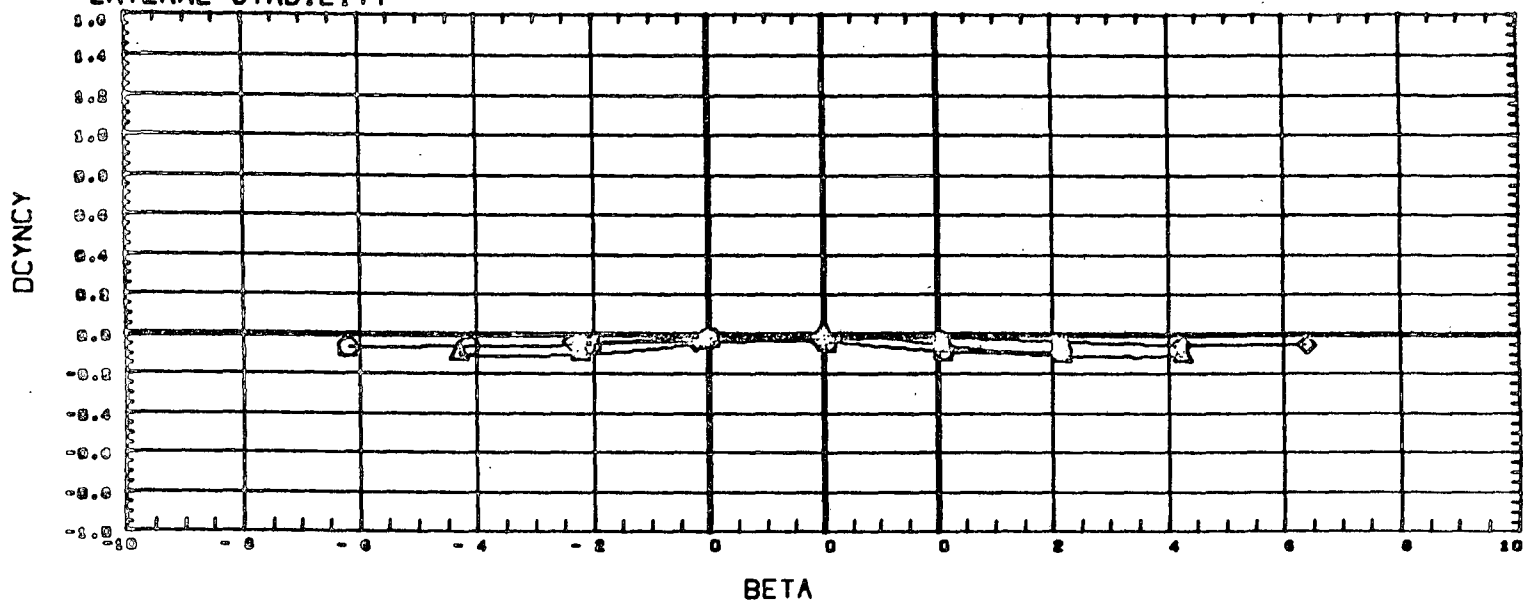
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LATERAL STABILITY



SYMBOL	WACH	ALPHA	PARAMETRIC VALUES	RUDDER	0.000
○	0.001	10.000			
△	0.002	50.000			
◇	1.100				

REFERENCE INFORMATION		
SREF	14.6636	80. IN.
LREF	4.5060	IN.
BREF	5.6350	IN.
XNRP	1.4021	IN.
YNRP	0.0000	IN.
ZNRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

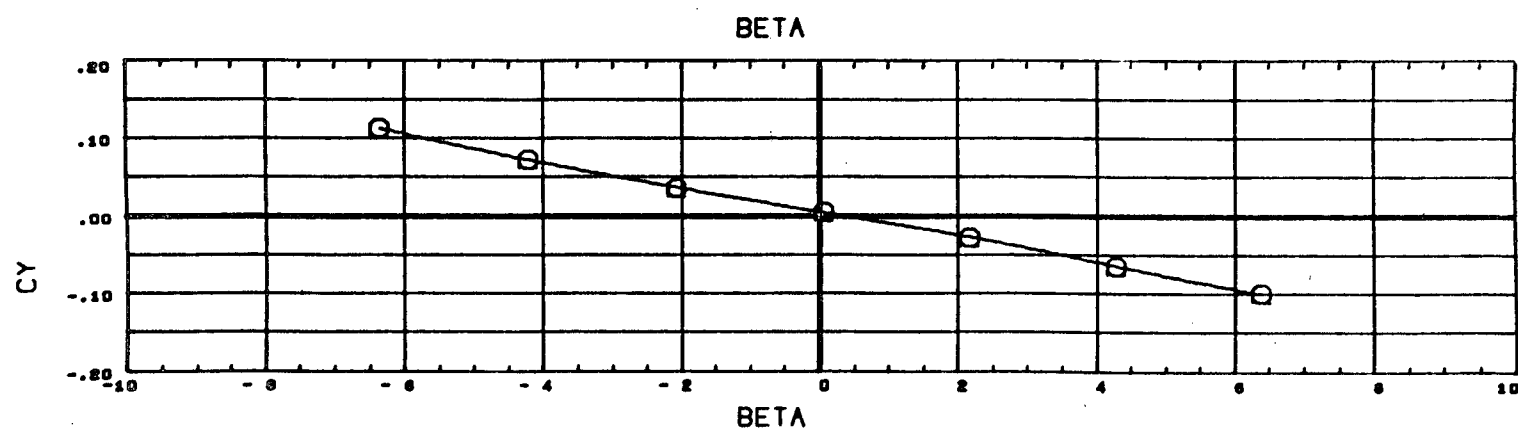
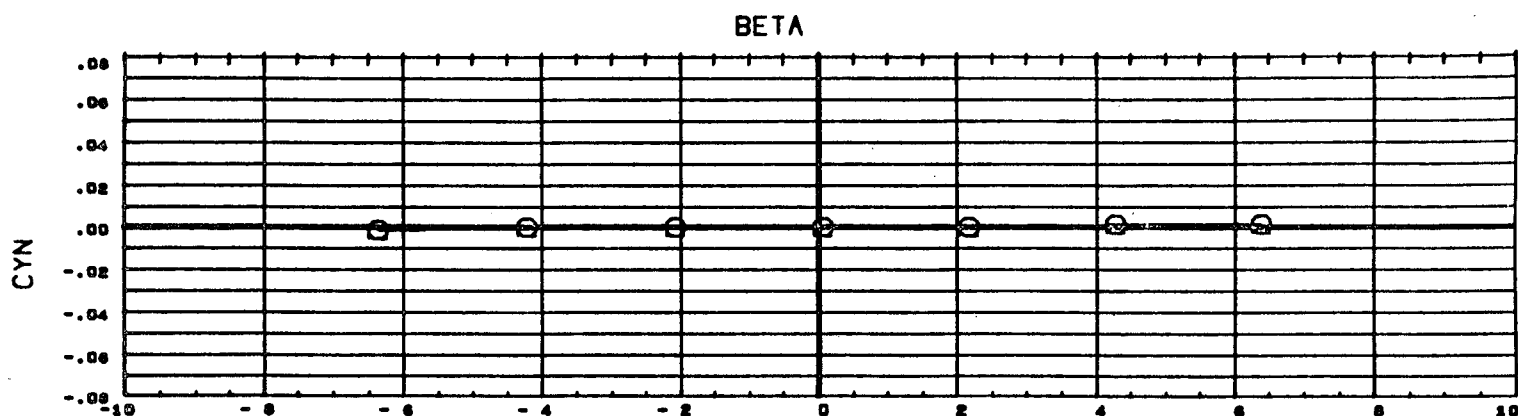
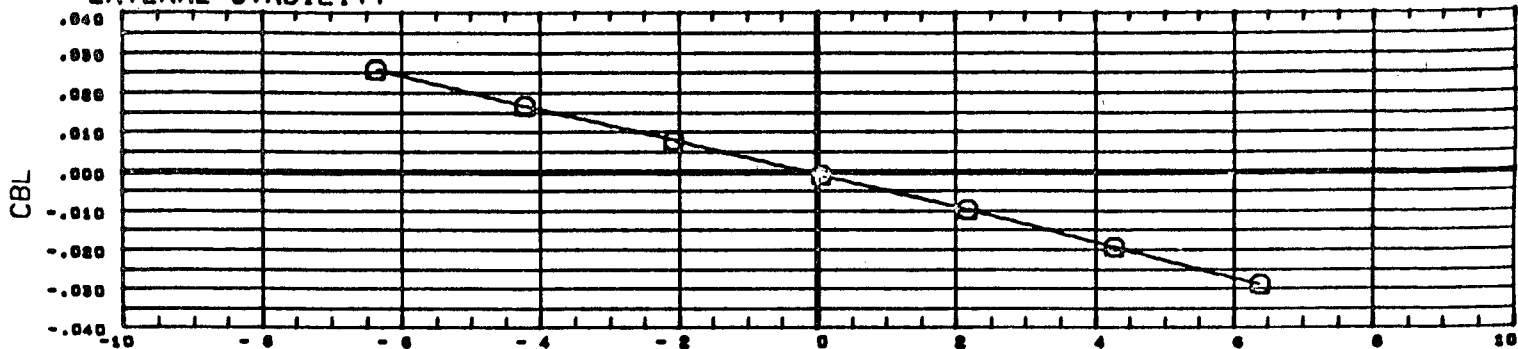
M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E3

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LATERAL STABILITY

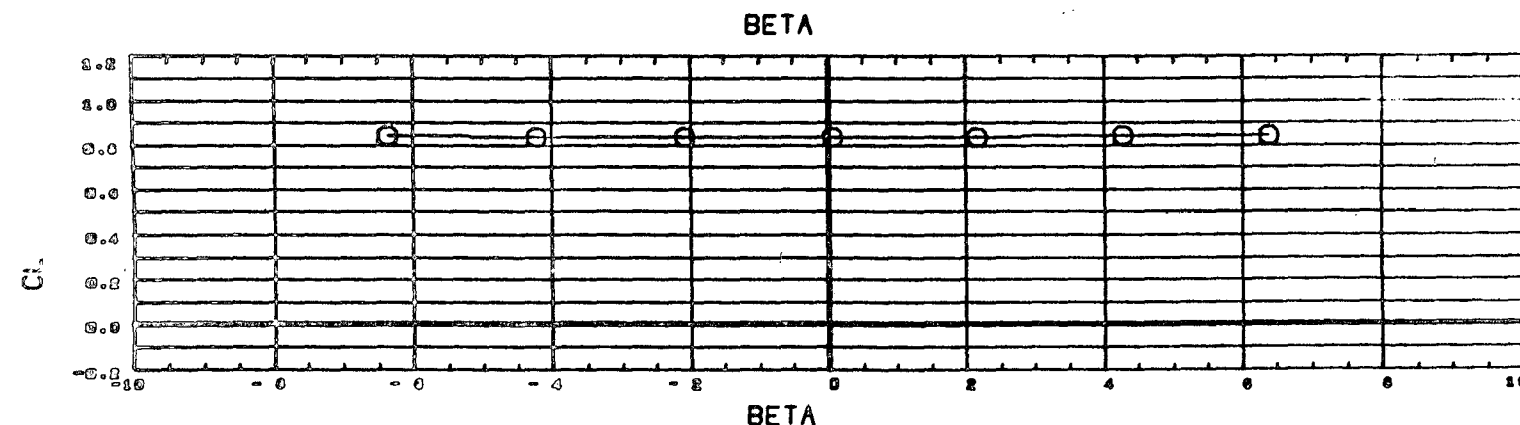
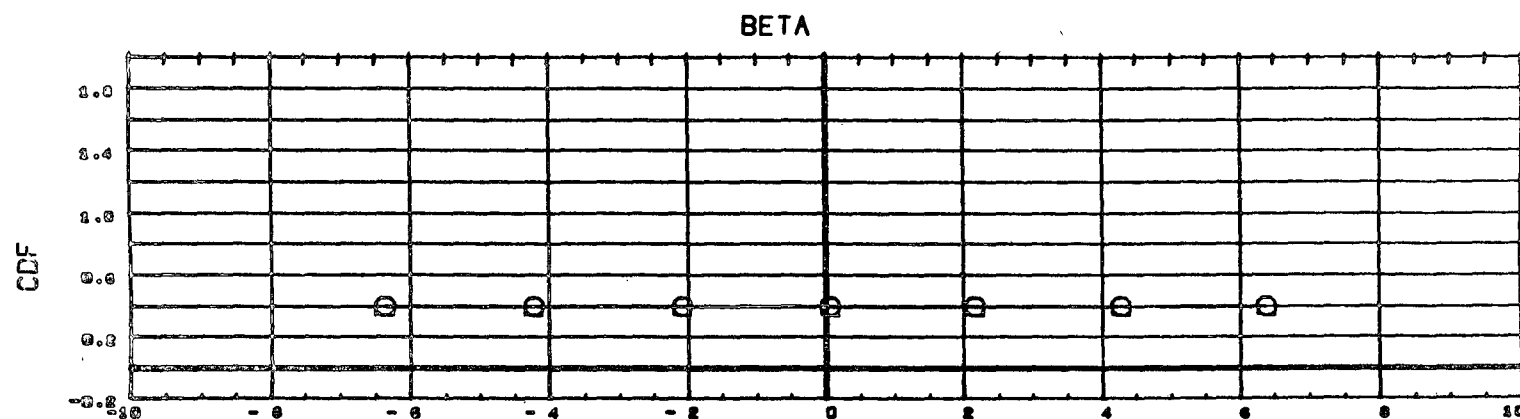
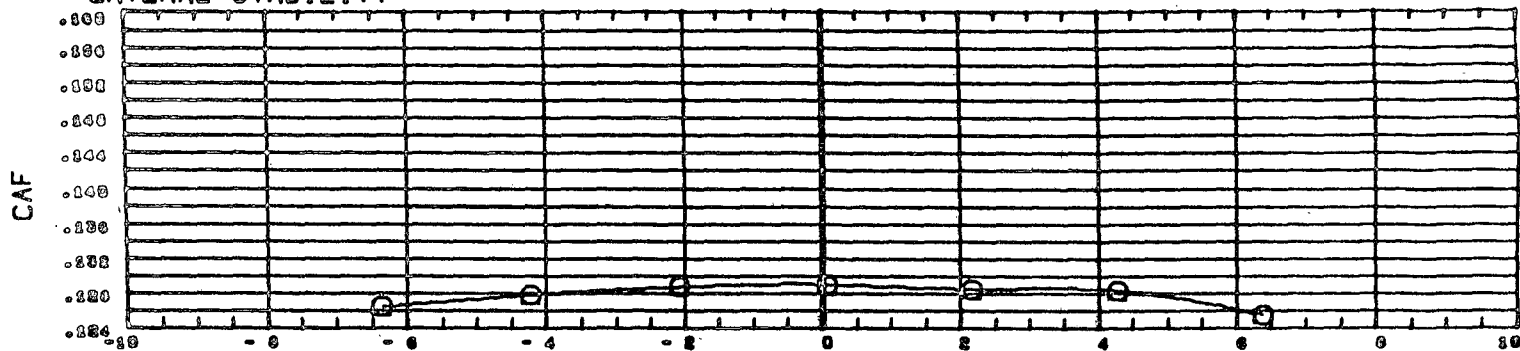


SYMBOL \square MACH 1.200
 PARAMETRIC VALUES
 ALPHA 15.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.5080 IN.
 BREF 9.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA MIST. CODE GC

LATERAL STABILITY



SYMBOL \bigcirc MACH 1.000 ALPHA 15.000 RUDDER 0.000
 RUDPLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.5080 IN.
 BREF 3.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

M513-MSFC MODELAR12161-2

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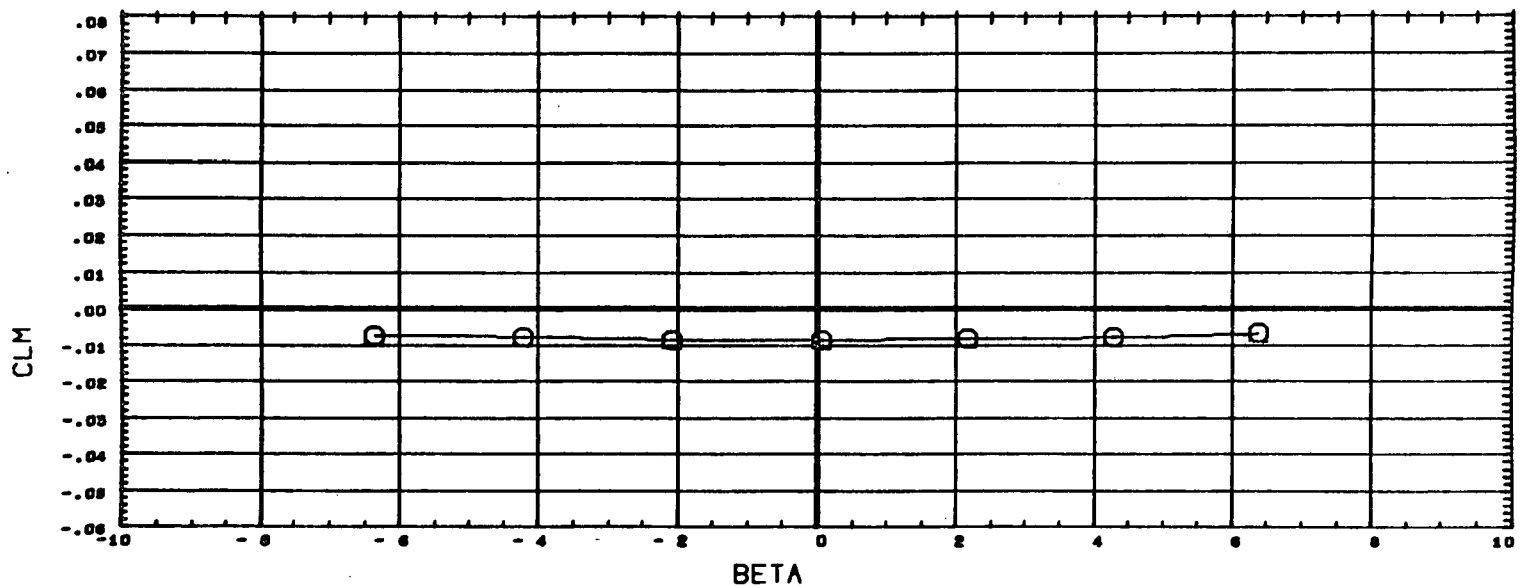
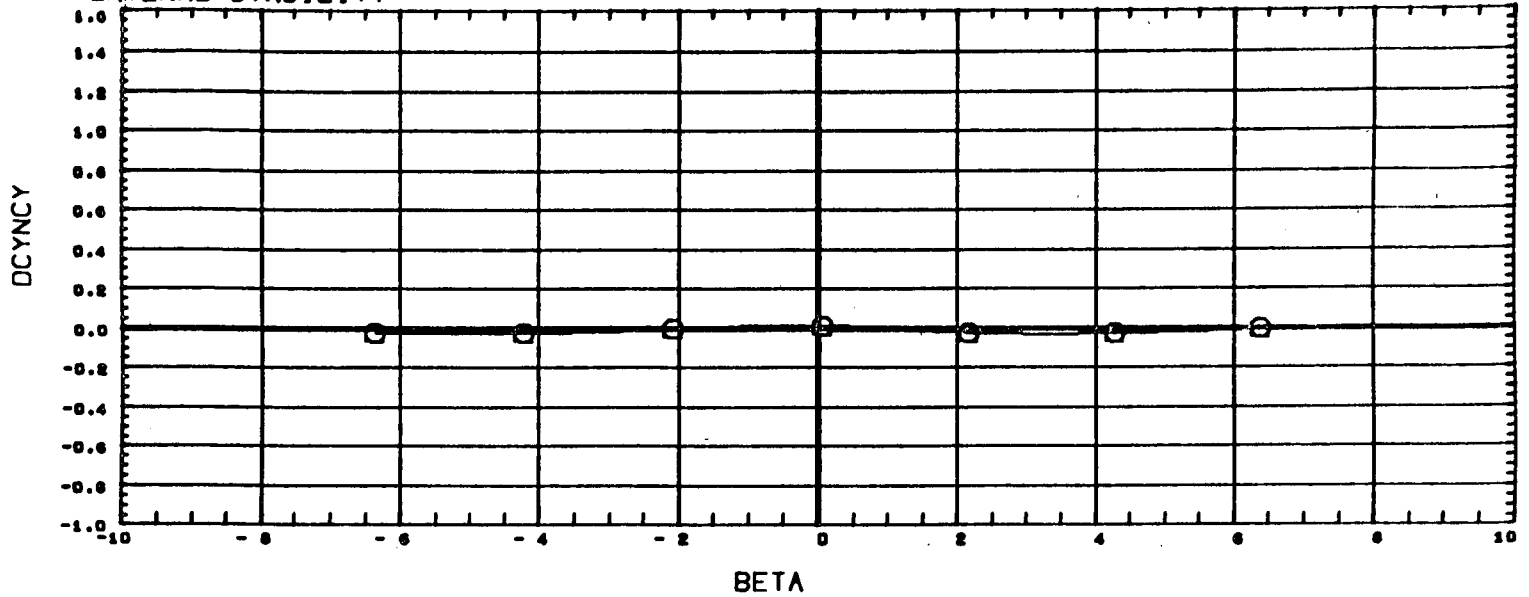
(C5309H)

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LATERAL STABILITY

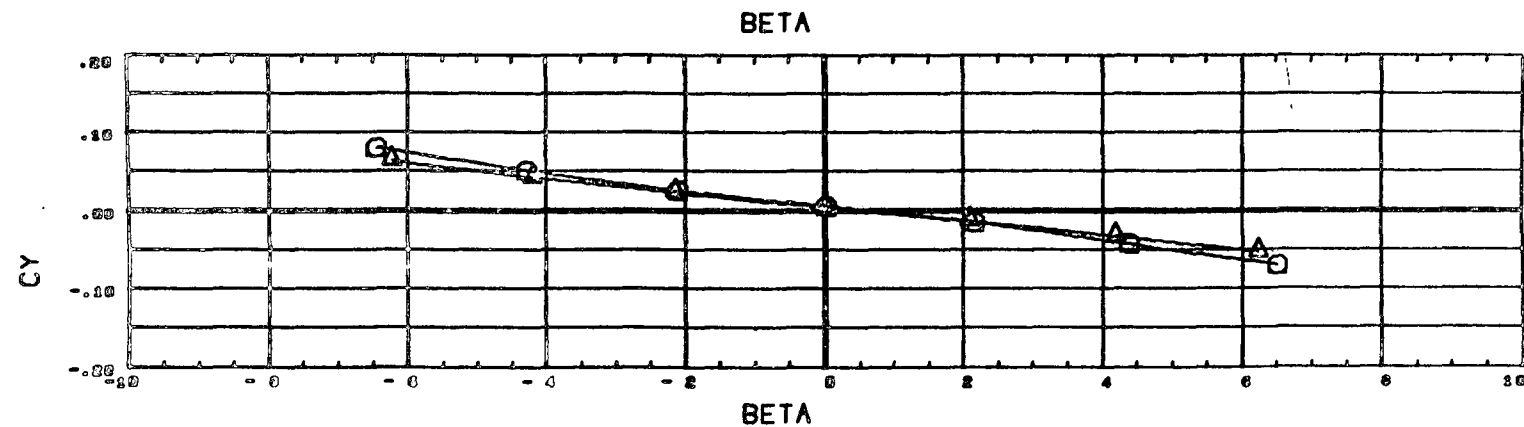
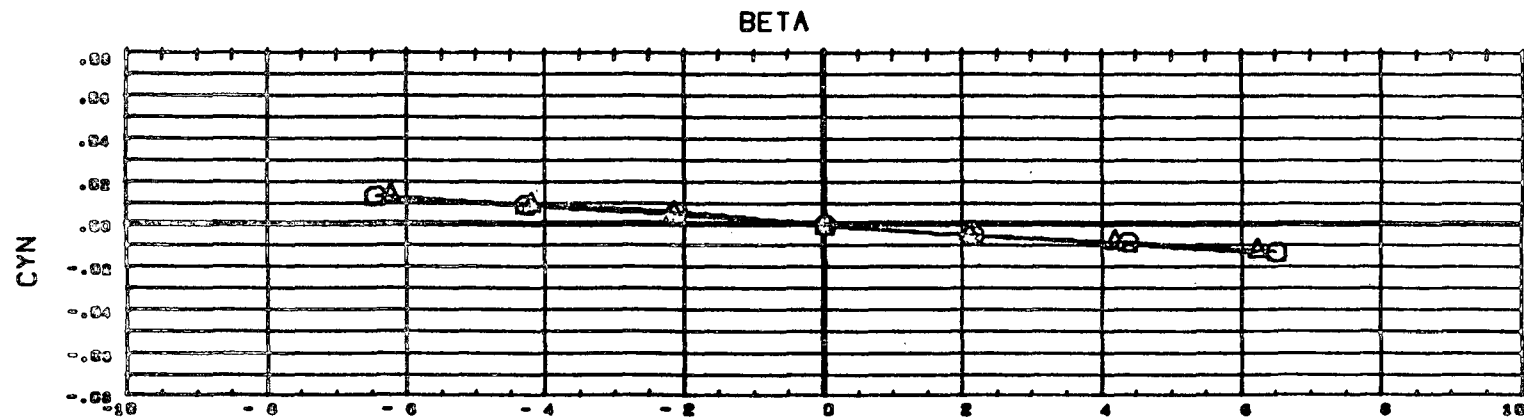
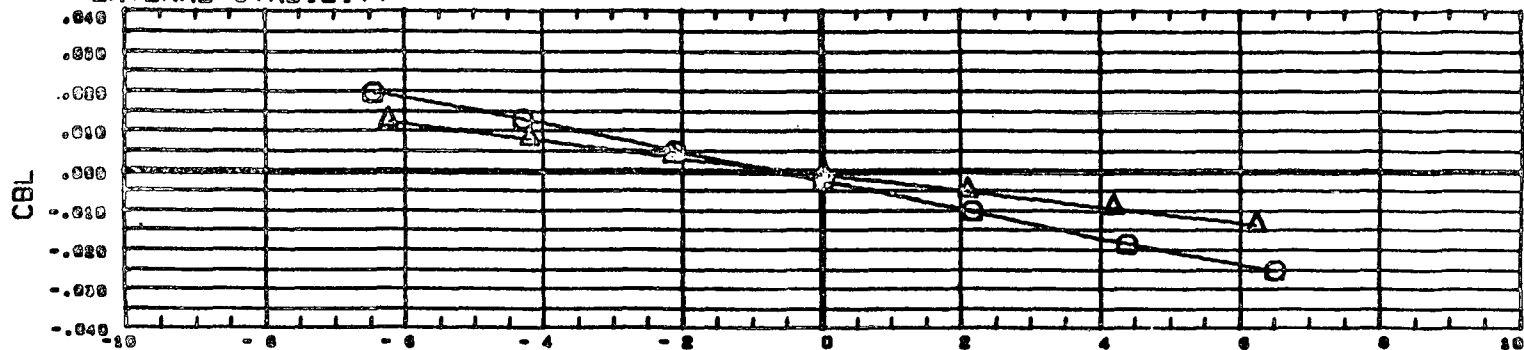


SYMBOL \square MACH 1.200
 PARAMETRIC VALUES
 ALPHA 15.000 RUDDER 0.000
 RUOFLR 30.000

DATA HIST. CODE 6C

REFERENCE INFORMATION
 SREF 14.6836 SQ. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES
○	1.967	ALPHA 25.000 RUDDER 0.000
△	2.470	RUDDLE 30.000

REFERENCE INFORMATION		
SREF	14.6836	80. IN.
LREF	4.3080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0030	

DATA HIST. CODE 6C

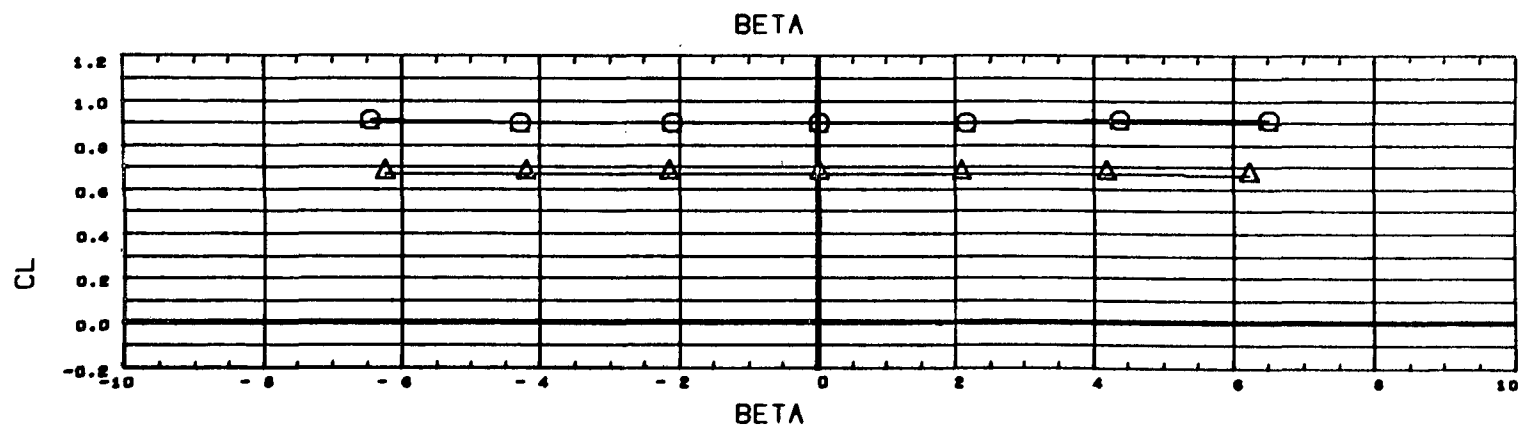
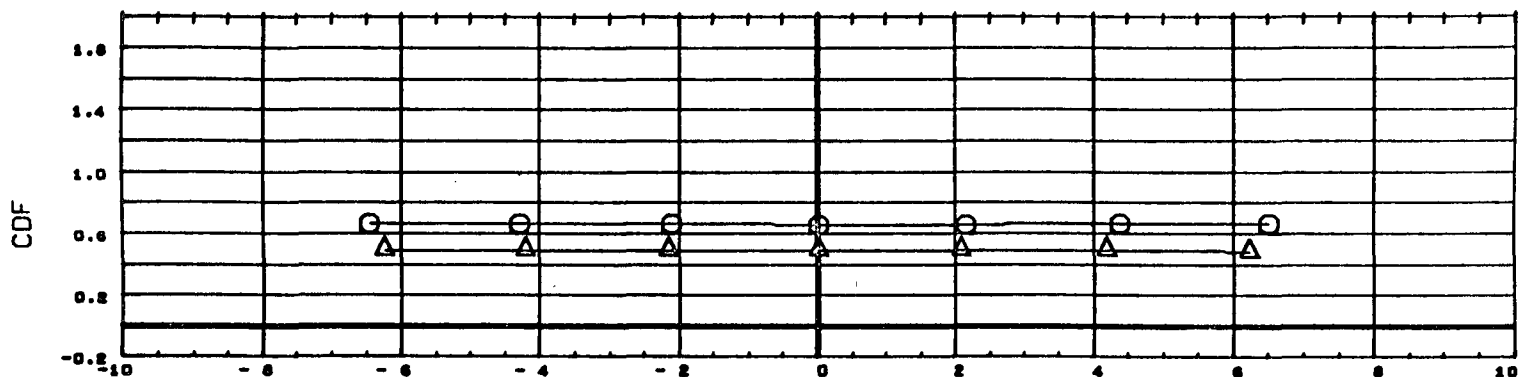
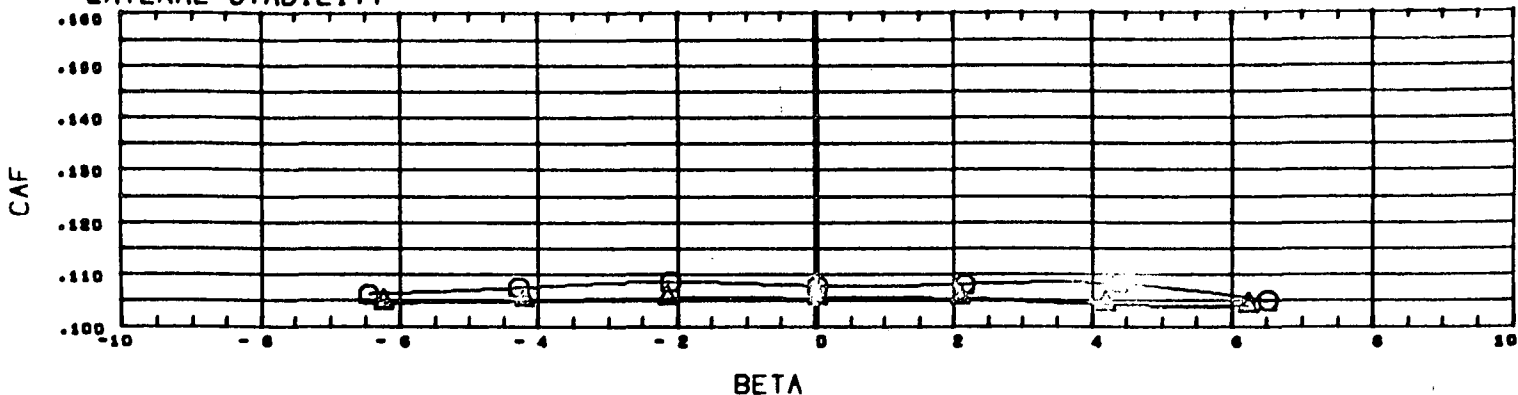
M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E3

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LATERAL STABILITY

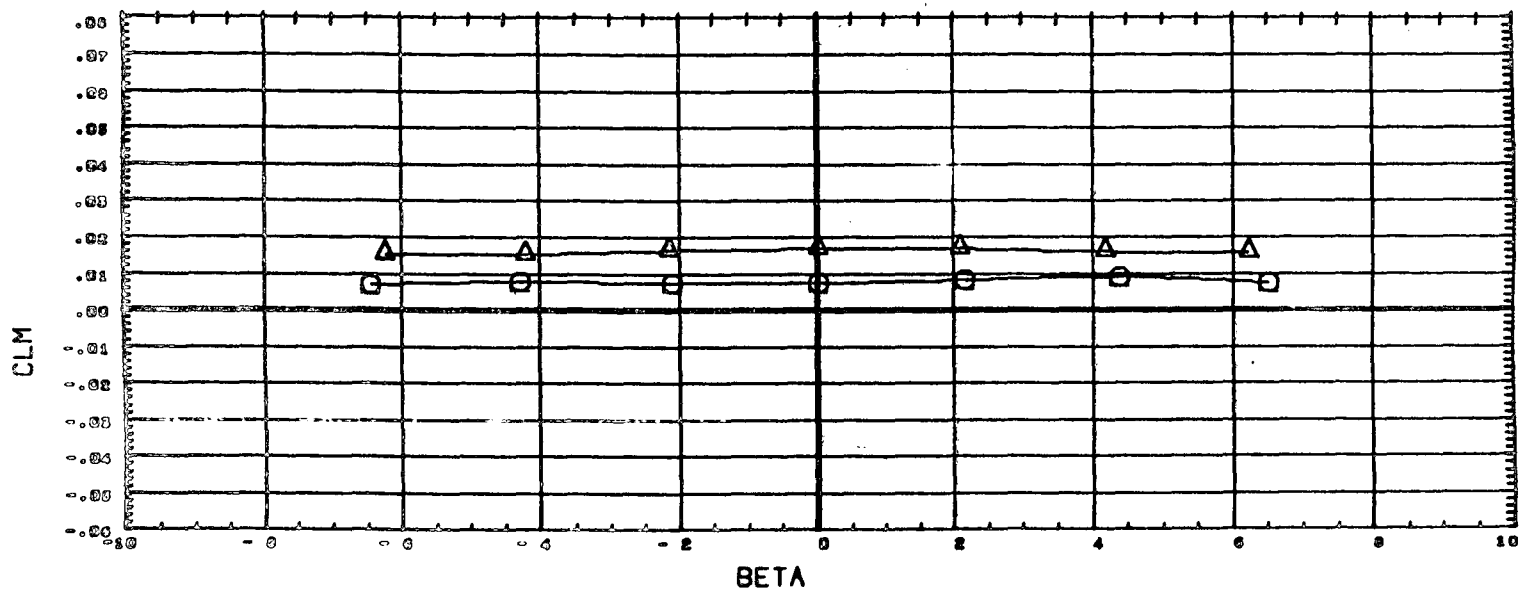
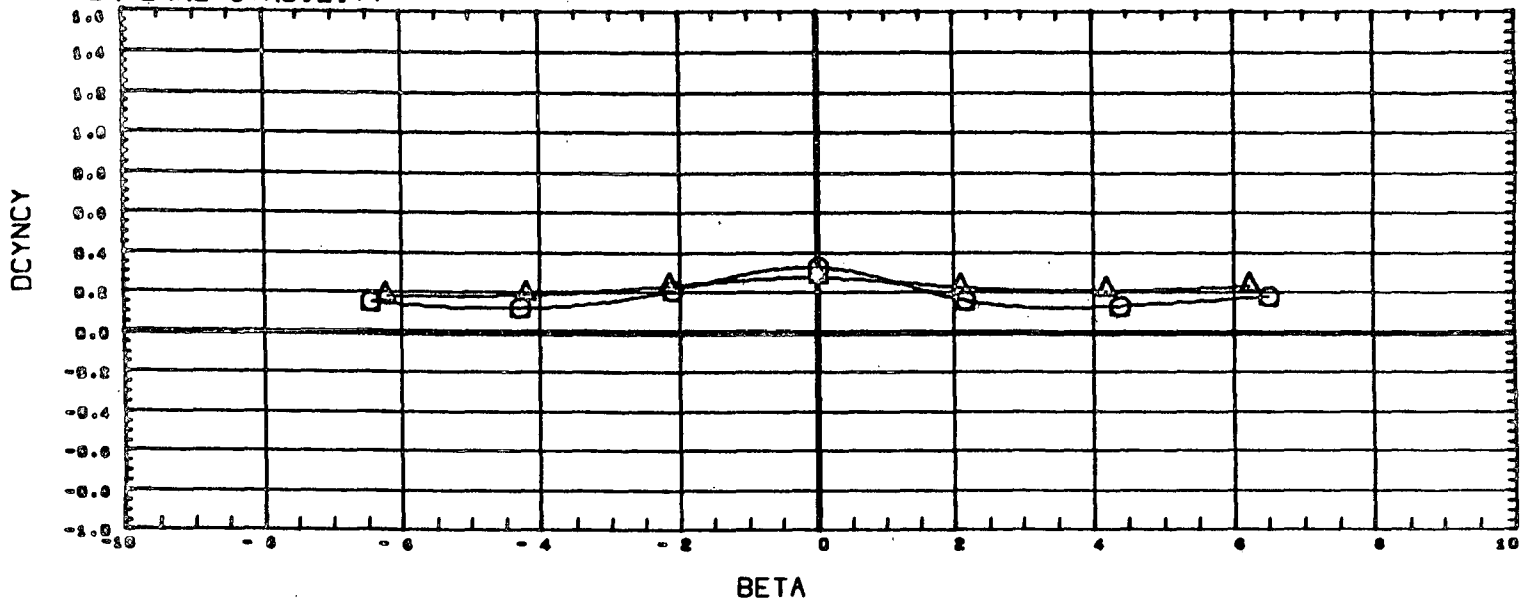


SYMBOL	MACH	PARAMETRIC VALUES		
○	1.967	ALPHA	25.000	RUDDER 0.000
△	3.479	RUDFLR	30.000	

REFERENCE INFORMATION		
SREF	14.6836	89. IN.
LREF	4.5080	IN.
BREF	9.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
○	1.067	ALPHA	25.000	RUDDER 0.000
△	3.070	RUDDFLR	30.000	

REFERENCE INFORMATION		
SREF	14.6836	88. IN.
LREF	4.3080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE 6C

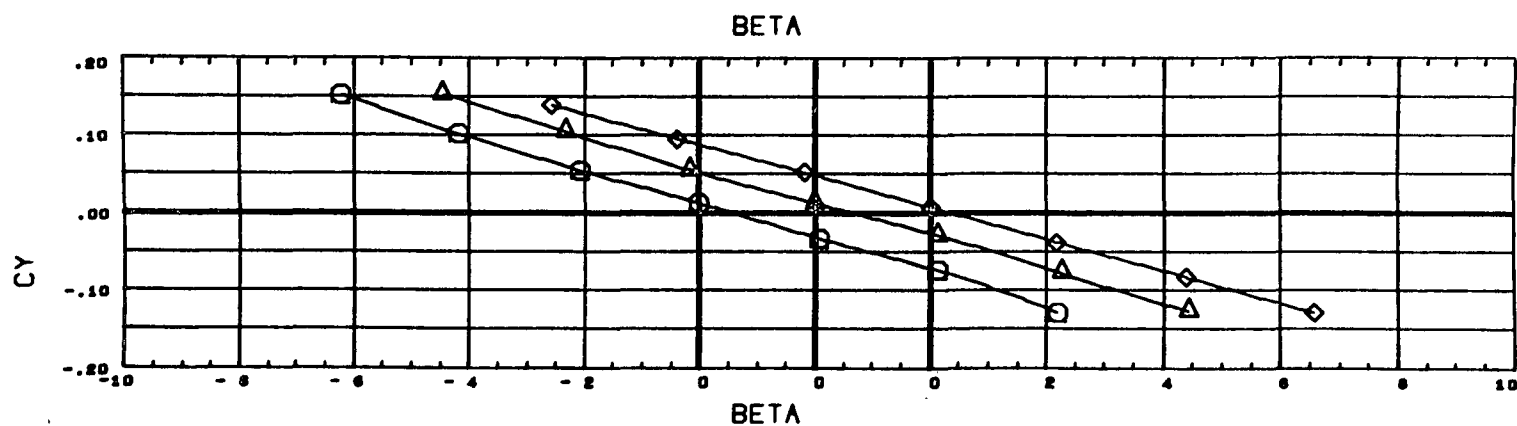
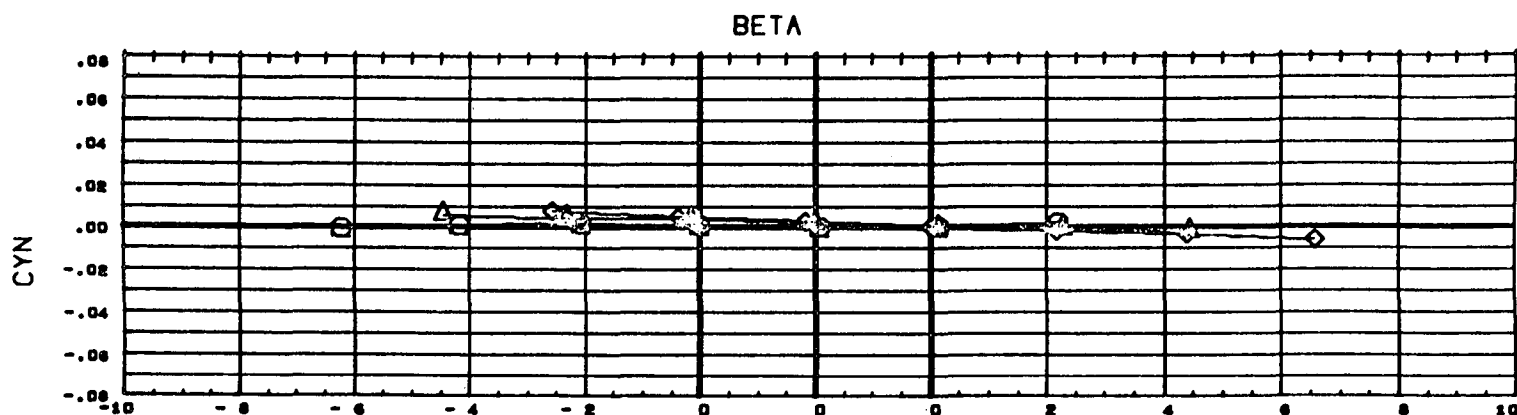
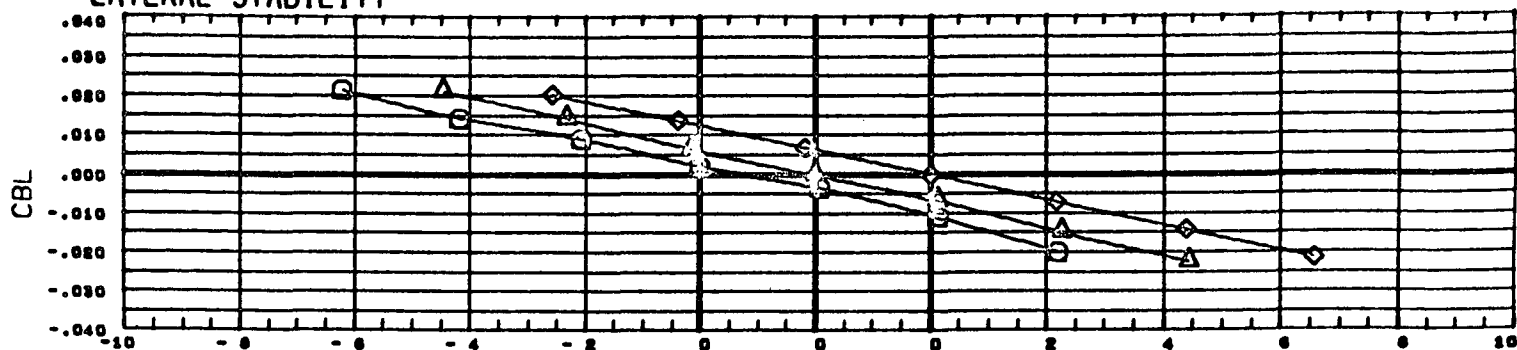
M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E3

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LATERAL STABILITY

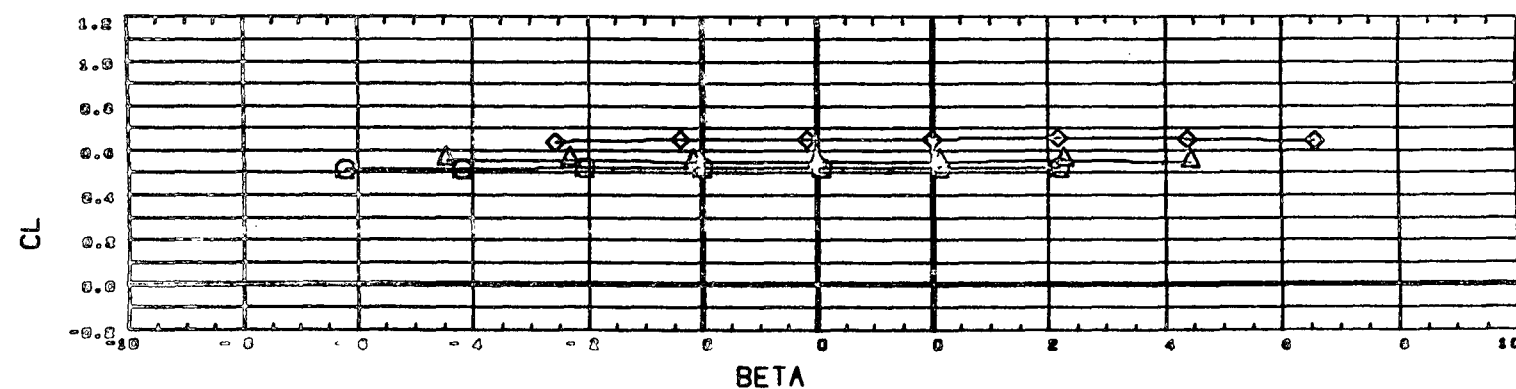
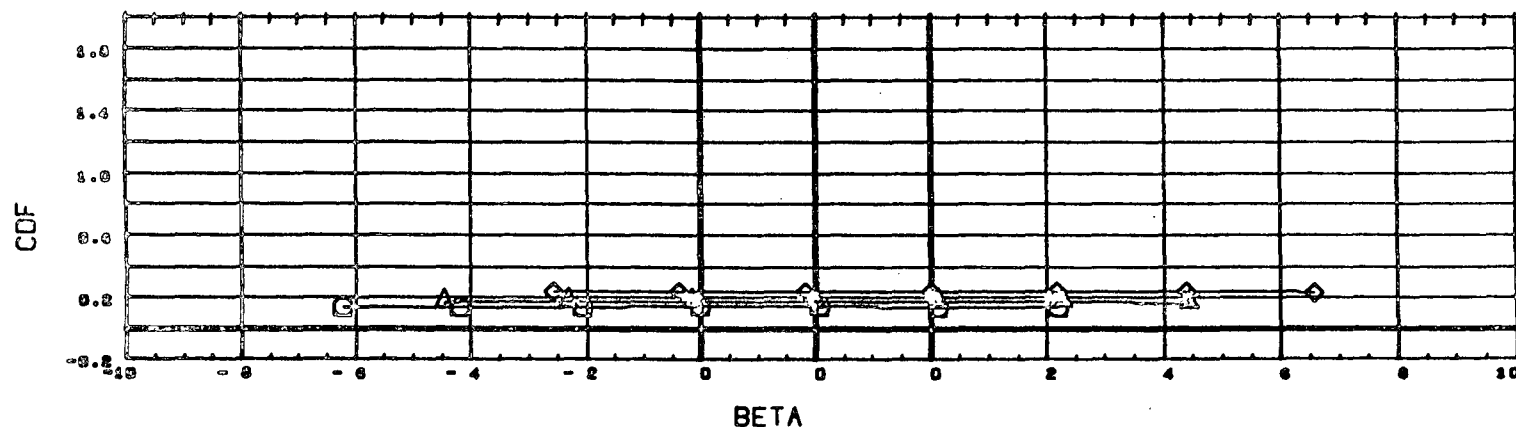
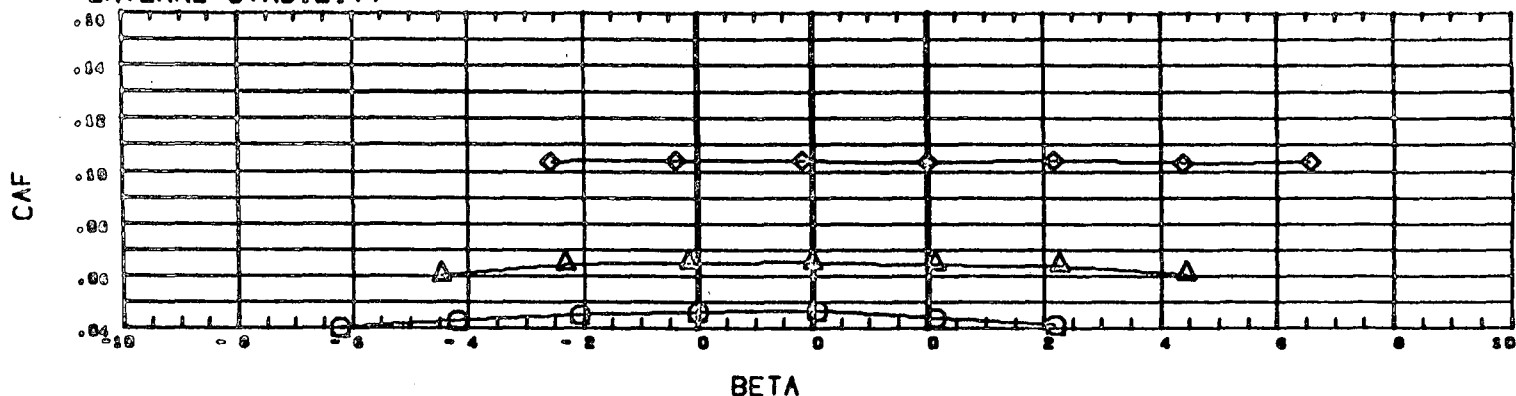


SYMBOL	MACH	PARAMETRIC VALUES		
○	0.598	ALPHA	10.000	RUDDER 0.000
△	0.909	RUDFLR	30.000	
◇	1.201			

REFERENCE INFORMATION		
SREF	14.6636	sq. in.
LREF	4.5060	in.
BREF	5.6530	in.
XNRP	1.4621	in.
YNRP	0.0000	in.
ZNRP	0.0000	in.
SCALE	0.0034	

DATA HIST. CODE GC

LATERAL STABILITY

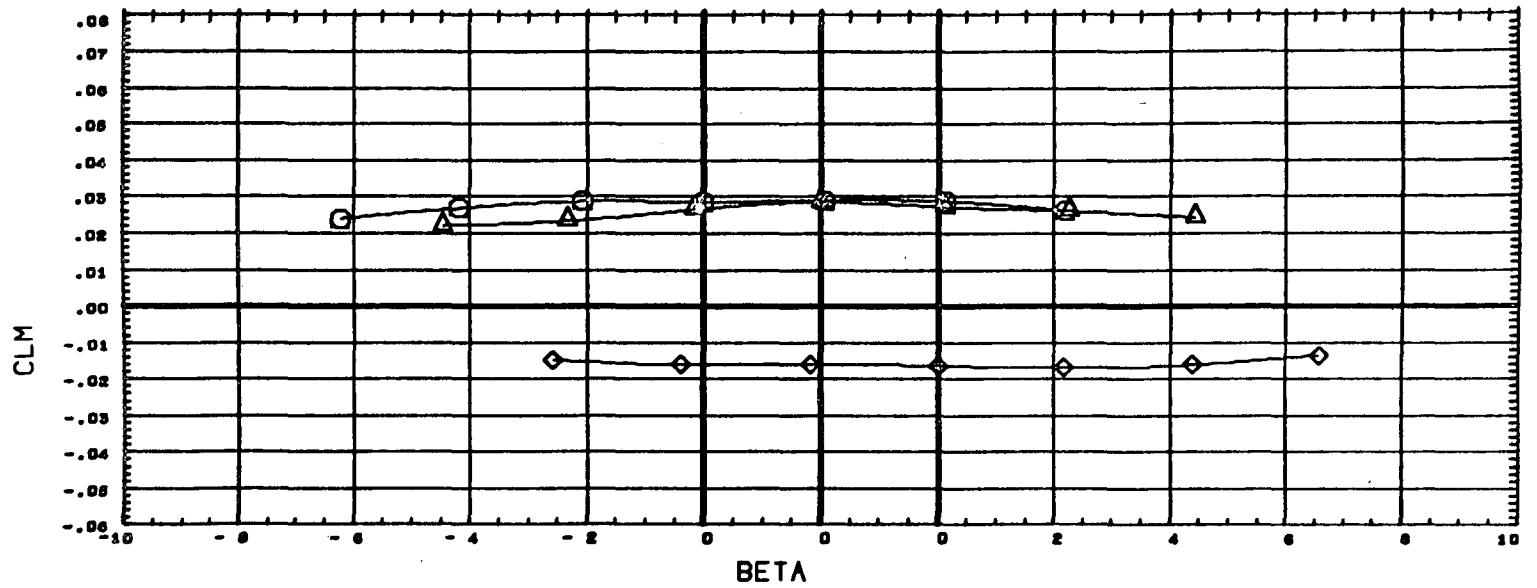
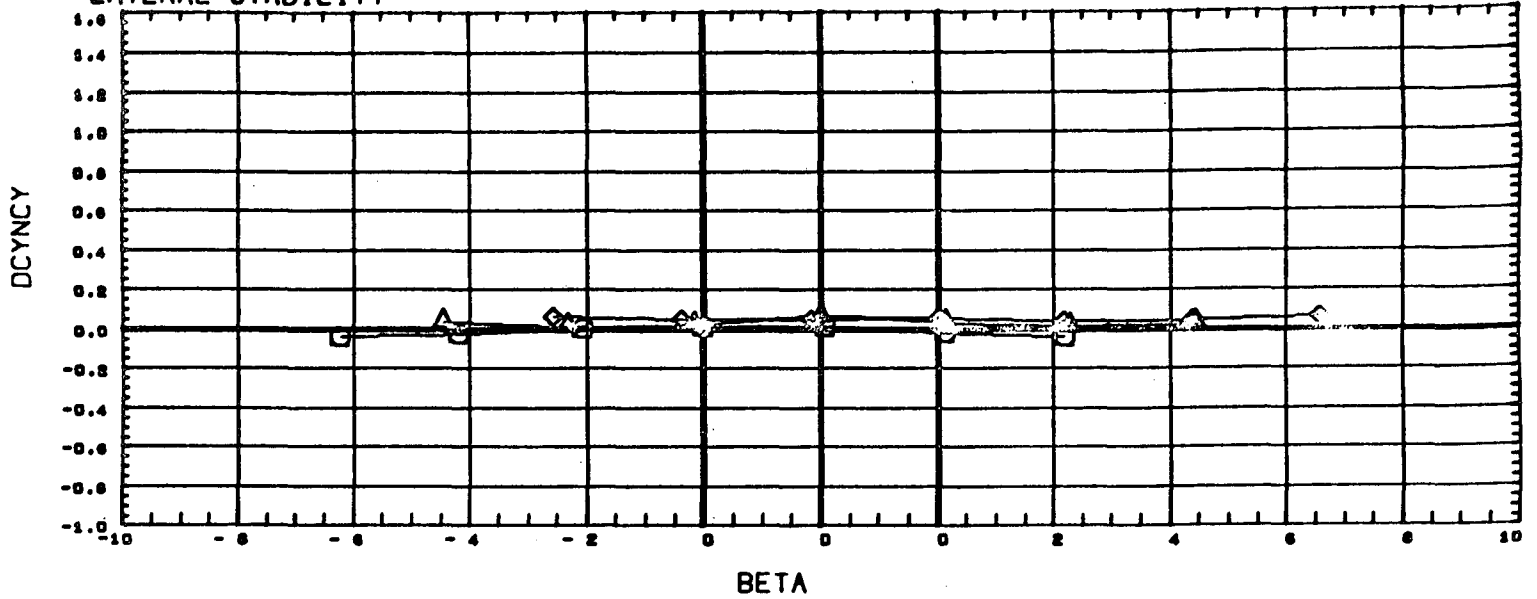


SYMBOL	WACH	PARAMETRIC VALUES		
◇	0.590	ALPHA	10.000	RUDDER 0.000
△	0.900	RUDDLER	30.000	
○	1.001			

REFERENCE INFORMATION		
SREF	14.6836	50 IN.
LREF	4.5060	IN.
BREF	5.6550	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE 6C

LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
○	0.598	ALPHA	10.000	RUDDER 0.000
△	0.905	RUDDLR	30.000	
◇	1.201			

REFERENCE INFORMATION		
SREF	14.6836	50. IN.
LREF	4.8080	IN.
BREF	9.8550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE 6C

M513-MSFC MODELAR12161-2

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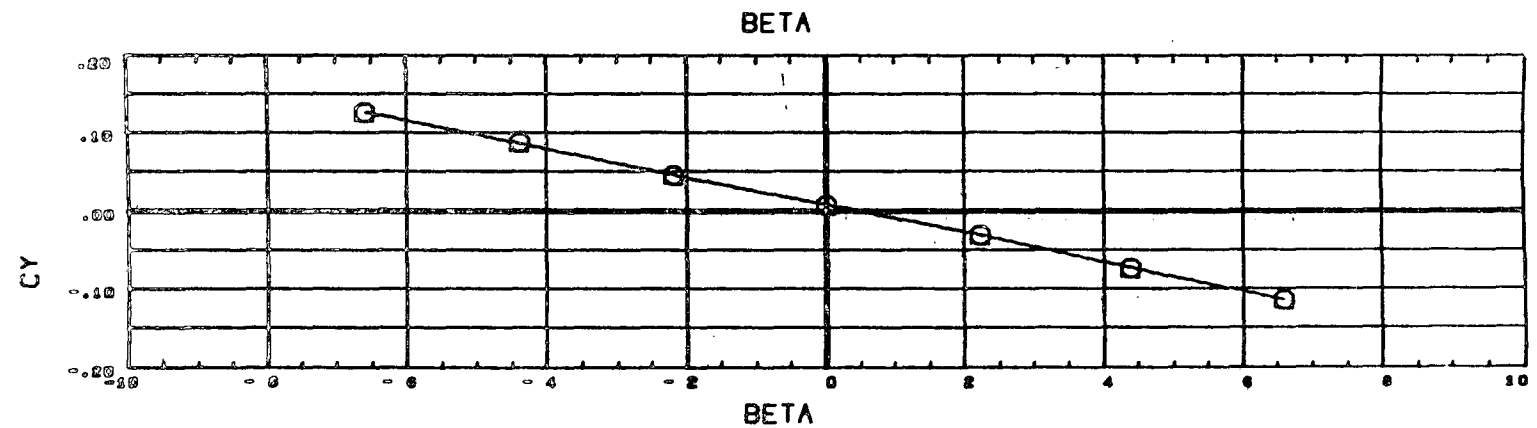
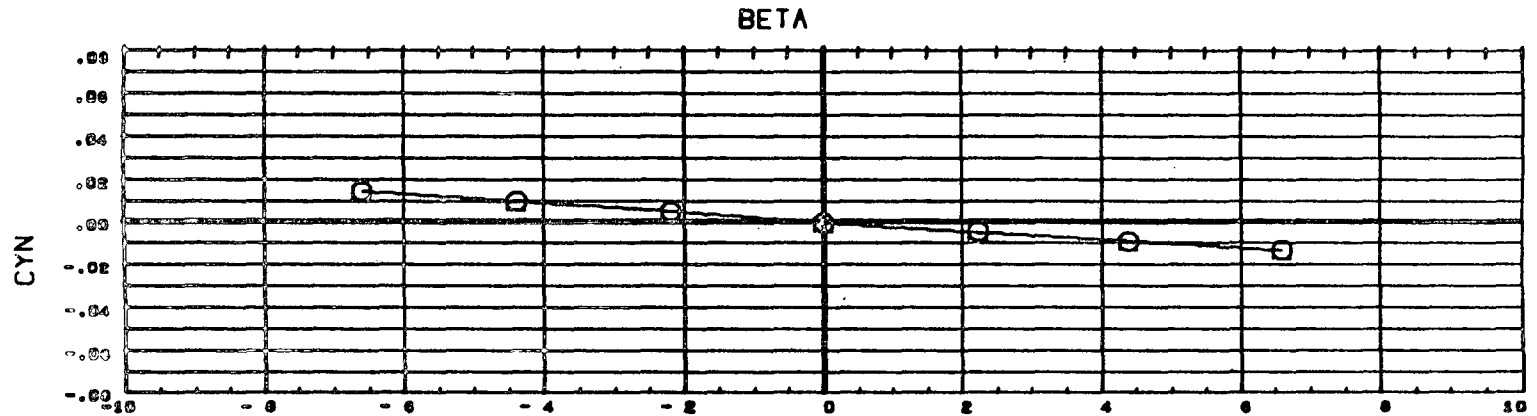
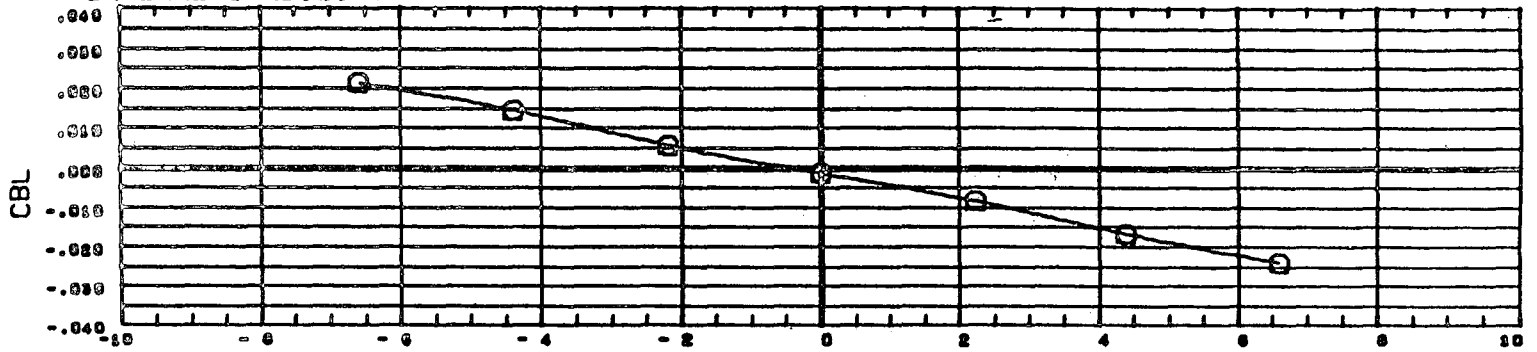
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LATERAL STABILITY



SYMBOL \square MACH 1.199
 PARAMETRIC VALUES
 ALPHA 19.000 RUDDER 0.000
 RUDDLR 20.000

REFERENCE INFORMATION
 SREF 14.6636 SQ. IN.
 LREF 4.3060 IN.
 BREF 9.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

M513-MSFC MODELAR12161-2

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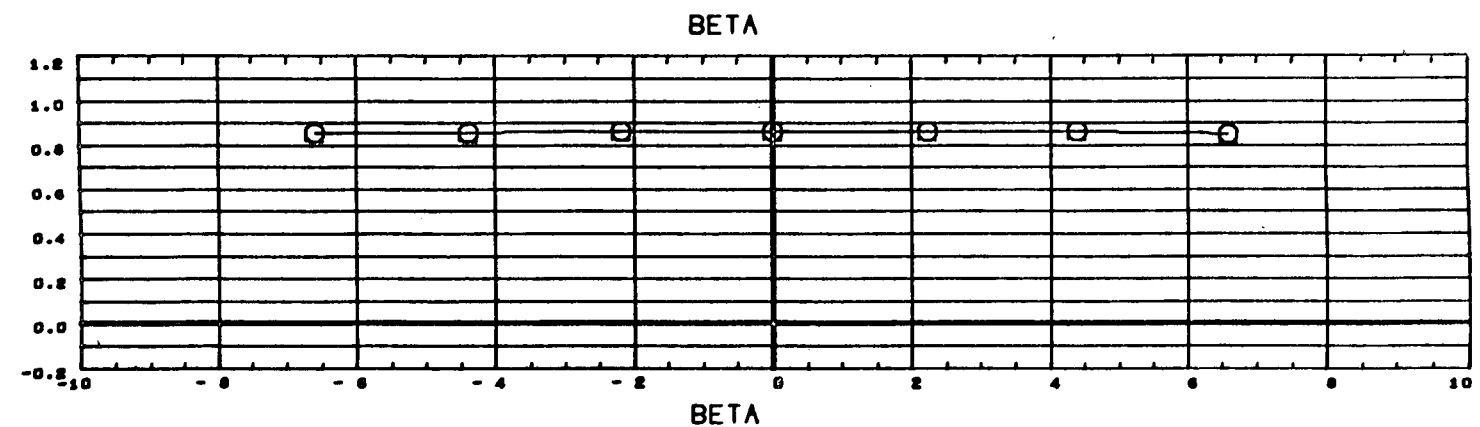
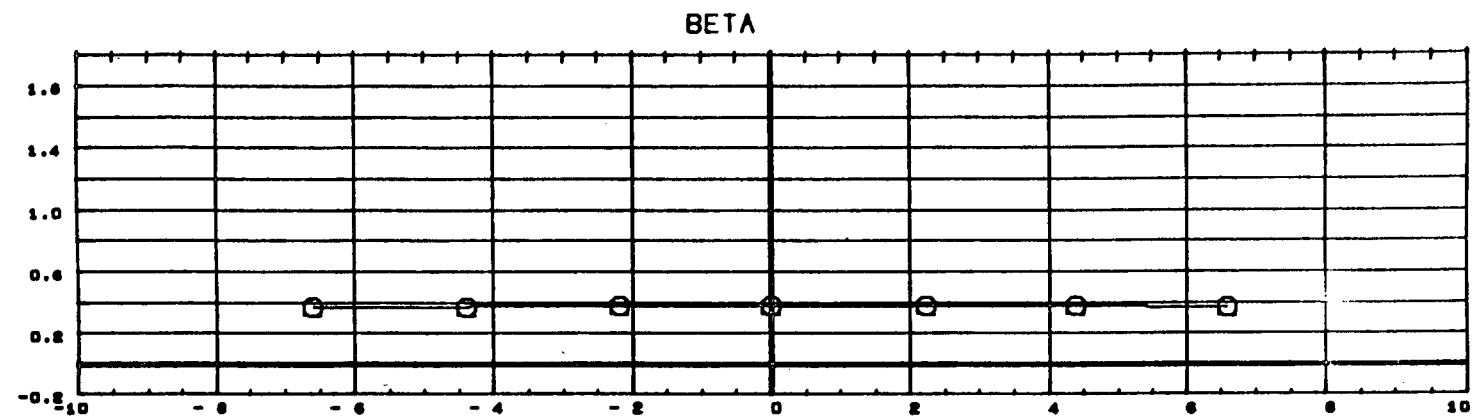
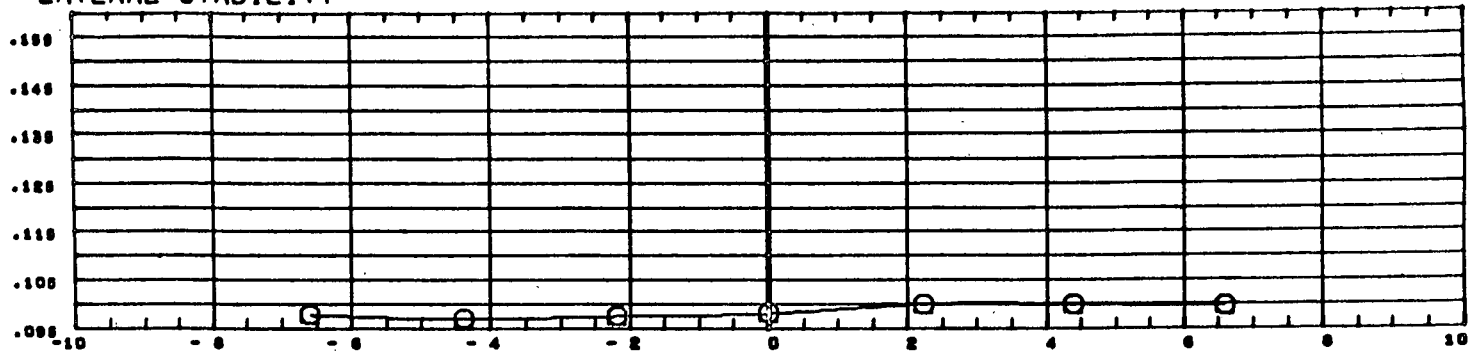
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LATERAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 O 1.198 ALPHA 15.000 RUDDER 0.000
 RUDDER 30.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.5080 IN.
 BREF 9.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

MS13-MSFC MODELAR12161-2

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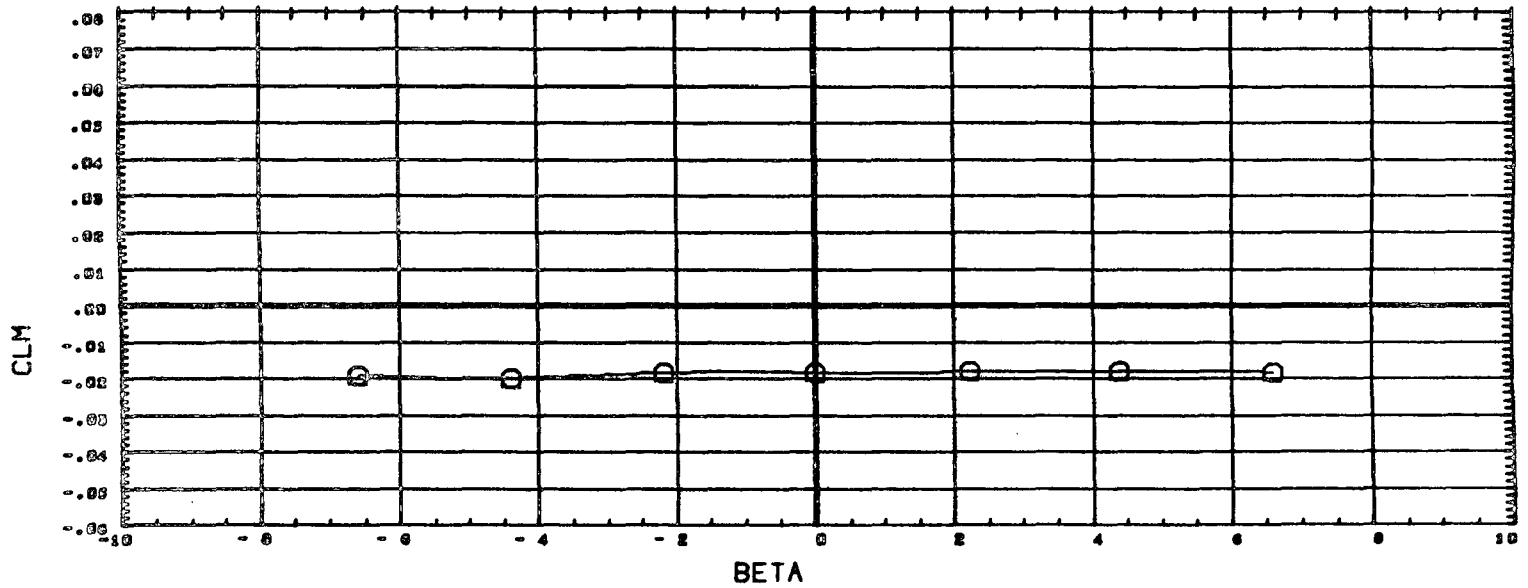
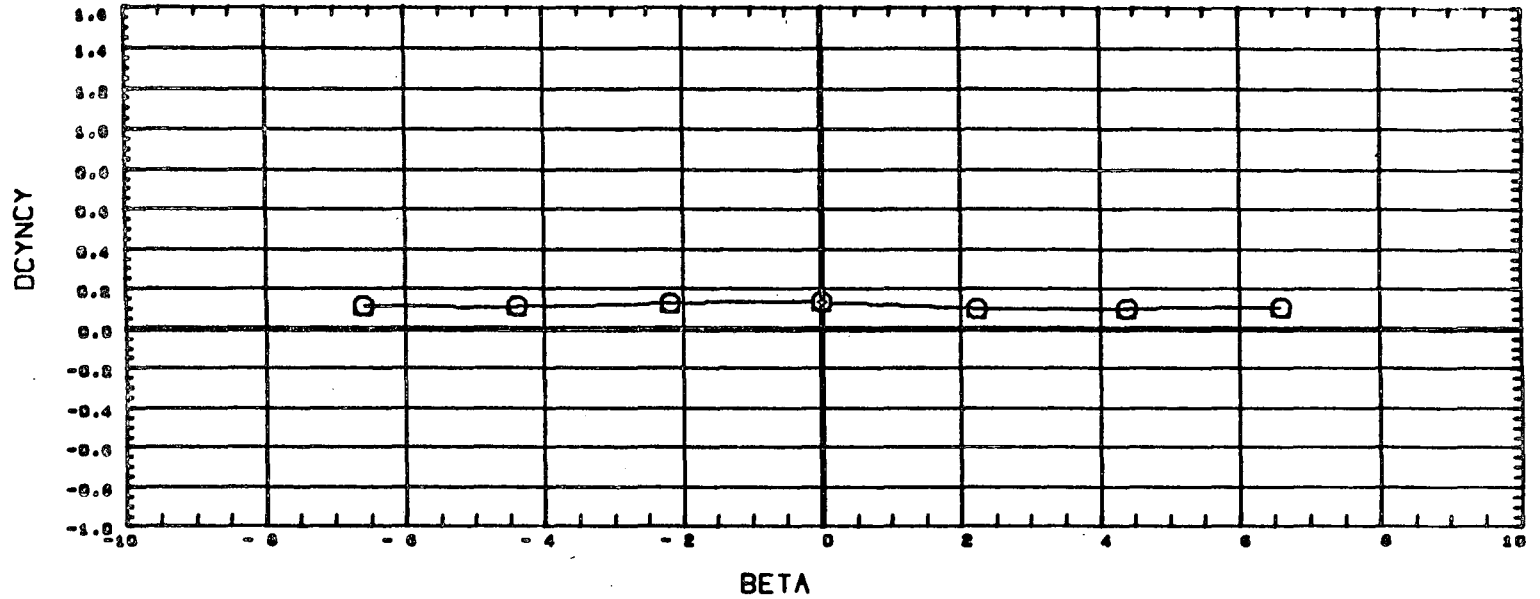
(C5310H)

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LATERAL STABILITY



SYMBOL \bigcirc MACH 1.100
 PARAMETRIC VALUES
 ALPHA 15.000 RUDDER 0.000
 RUDDLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 88. IN.
 LREF 4.5060 IN.
 BREF 5.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

M513-MSFC MODELAR12161-2

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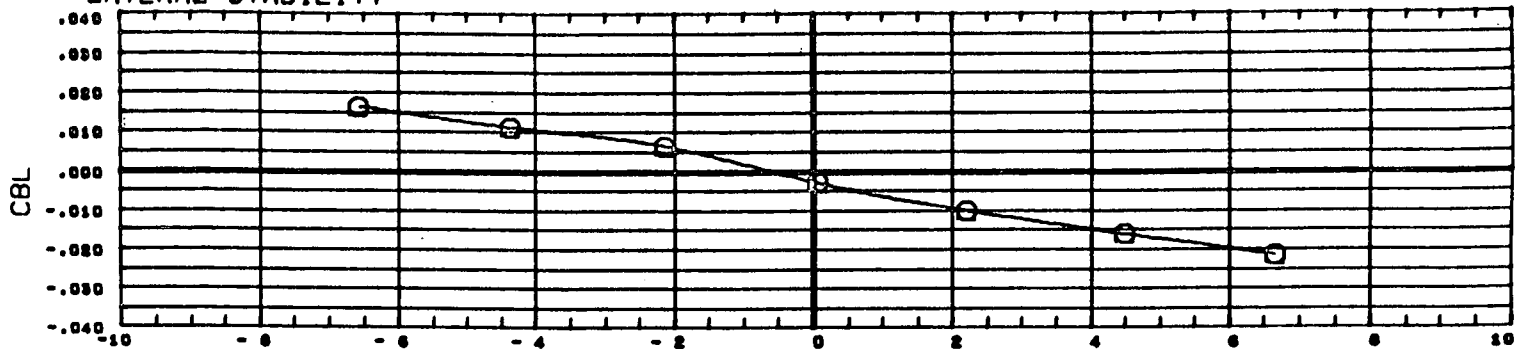
(C5310H)

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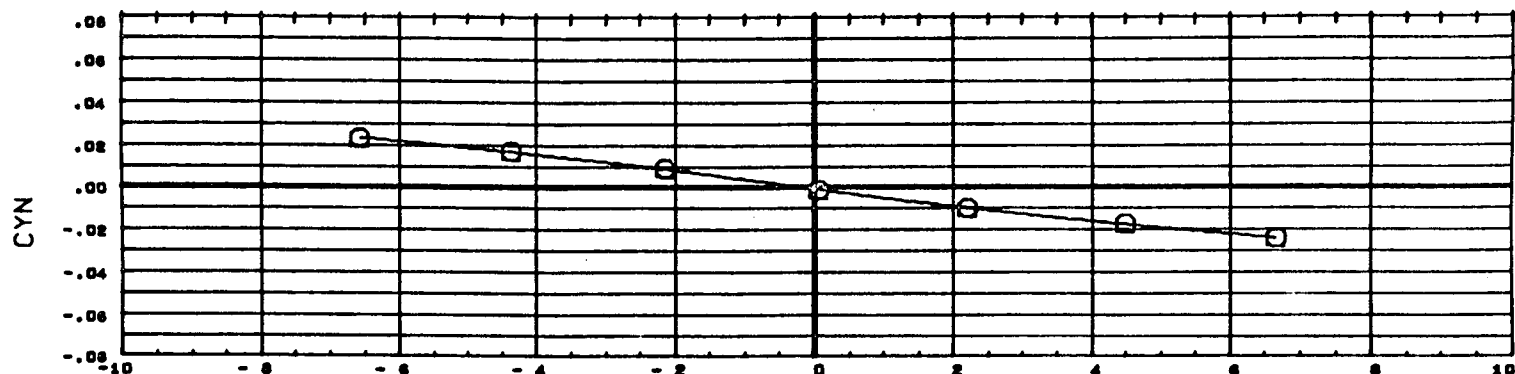
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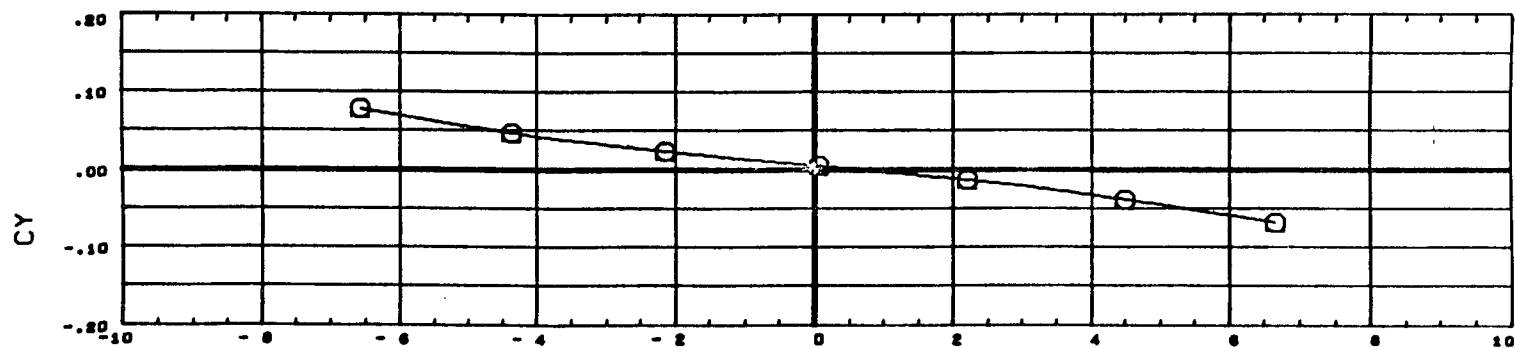
LATERAL STABILITY



BETA



BETA



BETA

SYMBOL	MACH	PARAMETRIC VALUES		
○	1.966	ALPHA	25.000	RUDDER 0.000
		RUDDLR	30.000	

REFERENCE INFORMATION		
SREF	14.6836	39. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE 6C

M513-MSFC MODELAR12161-2

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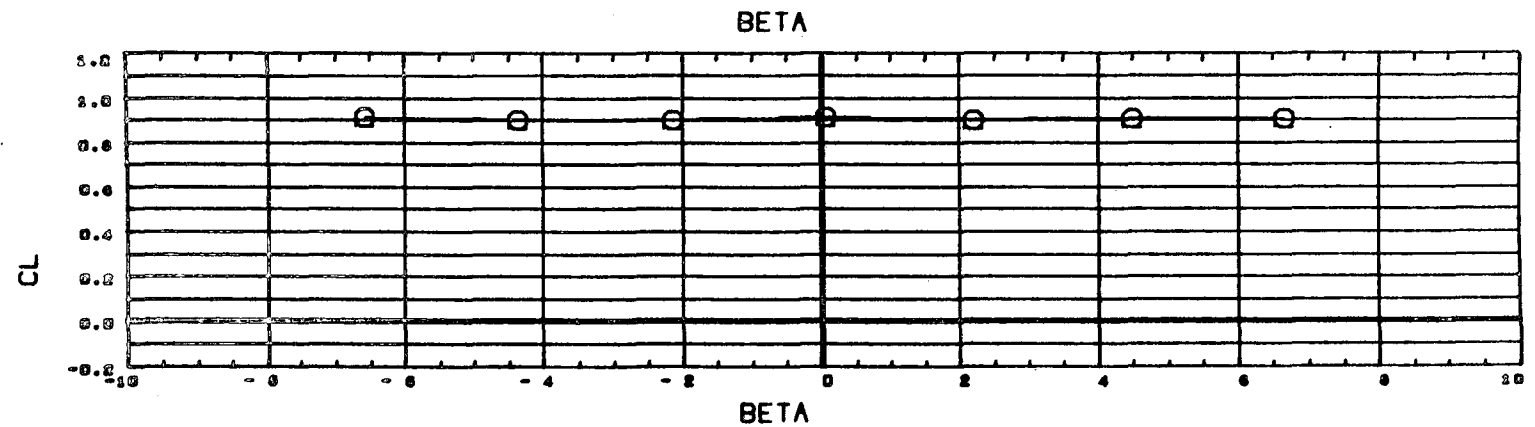
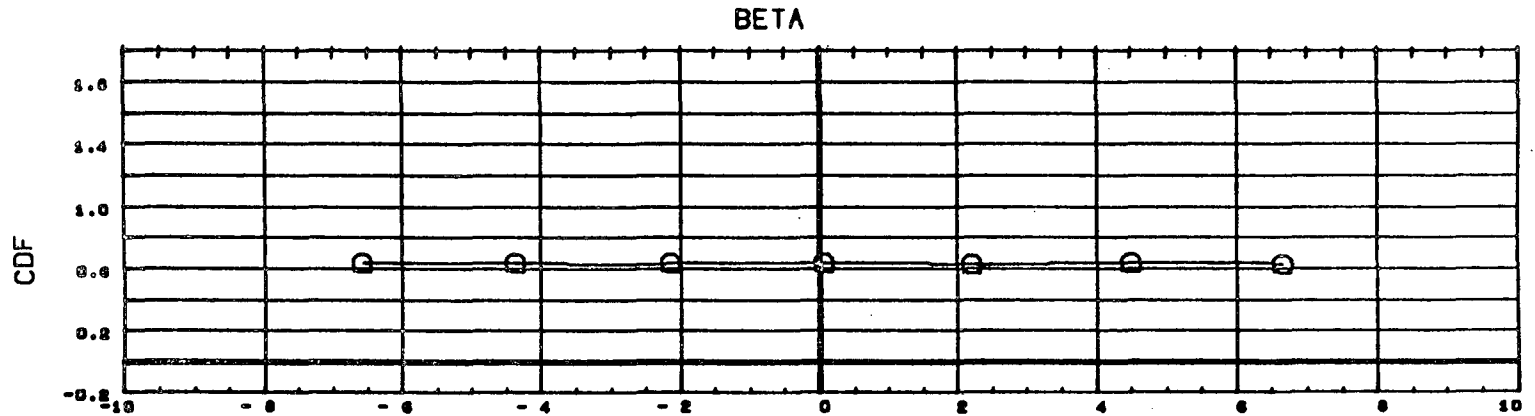
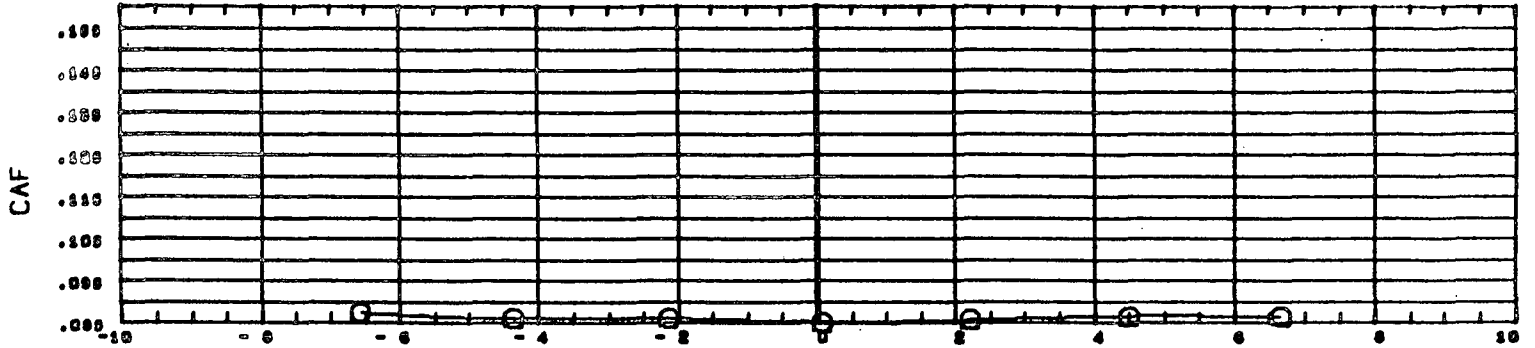
(C5310L)

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LATERAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 O 1.000 ALPHA 20.000 RUDDER 0.000
 RUDDLR 30.000

REFERENCE INFORMATION
 SREF 14.6536 SQ. IN.
 LREF 4.5060 IN.
 BREF 3.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

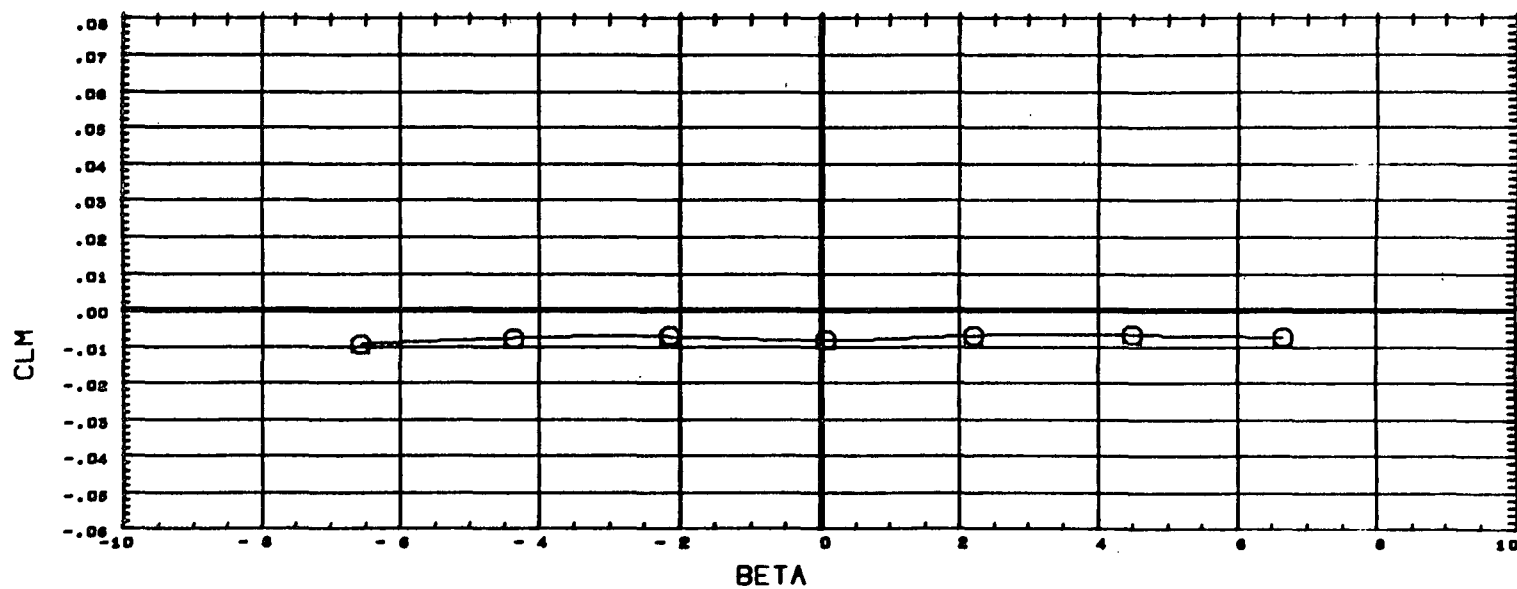
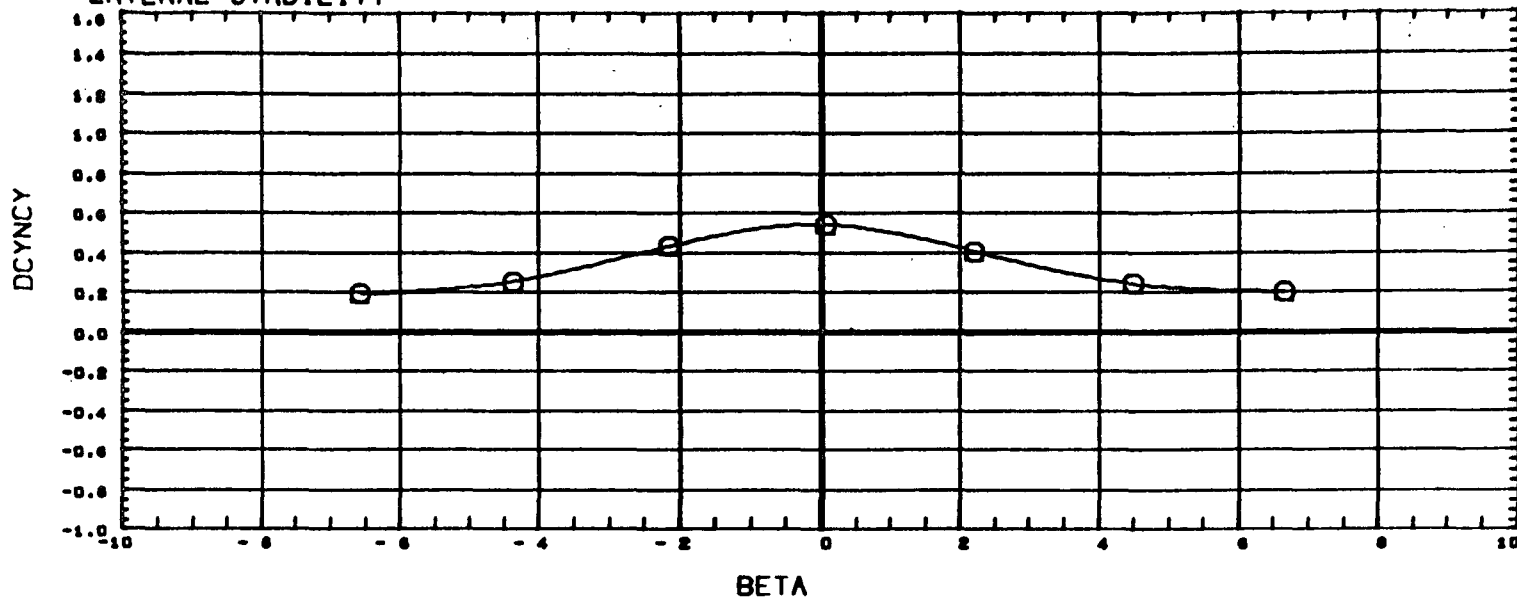
M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E4F

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LATERAL STABILITY



SYMBOL \square MACH 1.968 ALPHA 25.000 RUDDER 0.000
 RUDDFLR 30.000

DATA HIST. CODE 6C

REFERENCE INFORMATION
 SREF 14.6636 80. IN.
 LREF 4.5080 IN.
 BREF 9.6950 IN.
 XHRP 1.4821 IN.
 YHRP 0.0000 IN.
 ZHRP 0.0000 IN.
 SCALE 0.0034

M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E4F

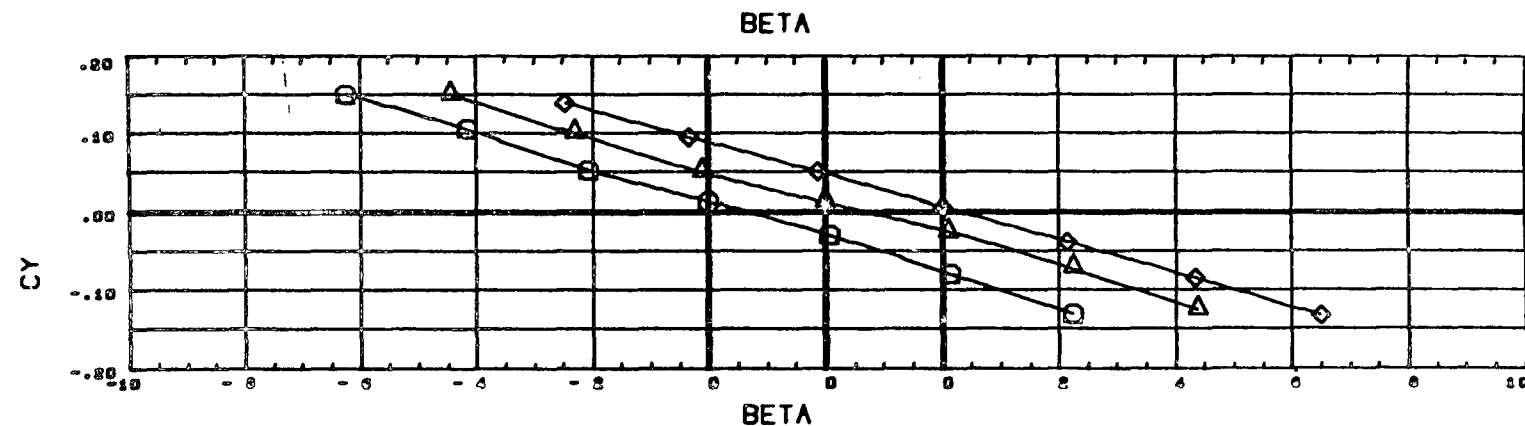
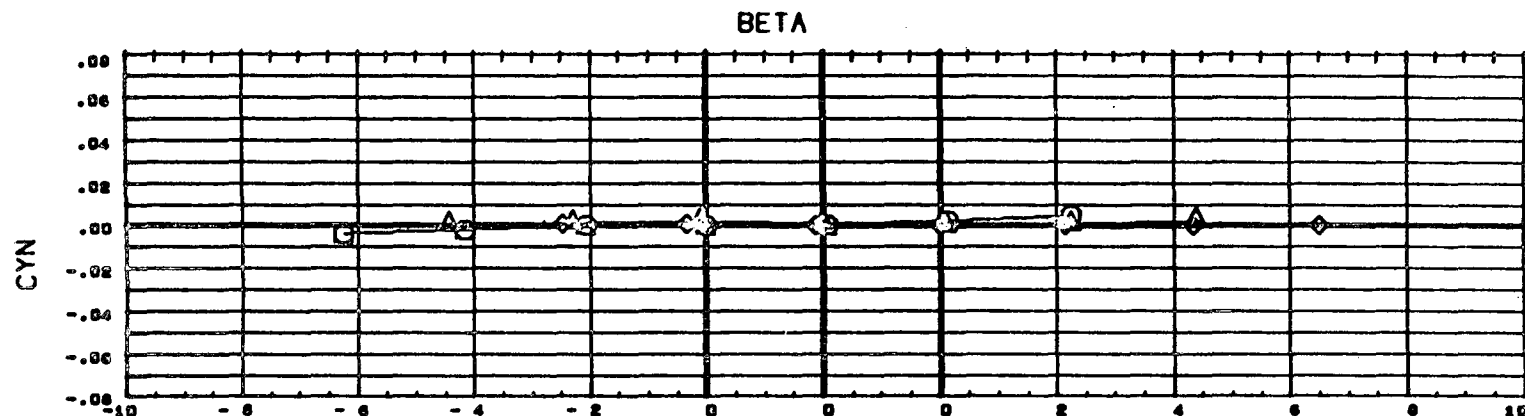
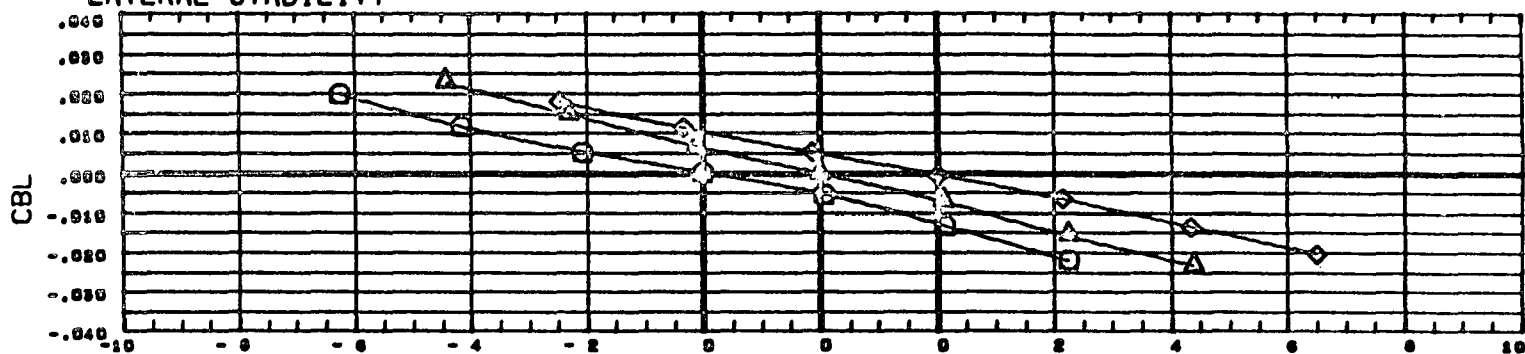
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LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES
○	0.001	ALPHA 10.000 RUDDER 0.000
△	0.900	RUDFLR 30.000
◇	1.800	

REFERENCE INFORMATION		
SREF	14.6636	89. IN.
LREF	4.5060	IN.
BREF	5.6550	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

M513-MSFC MODELAR1216I-2

B5CW11AF2S1V7E4A

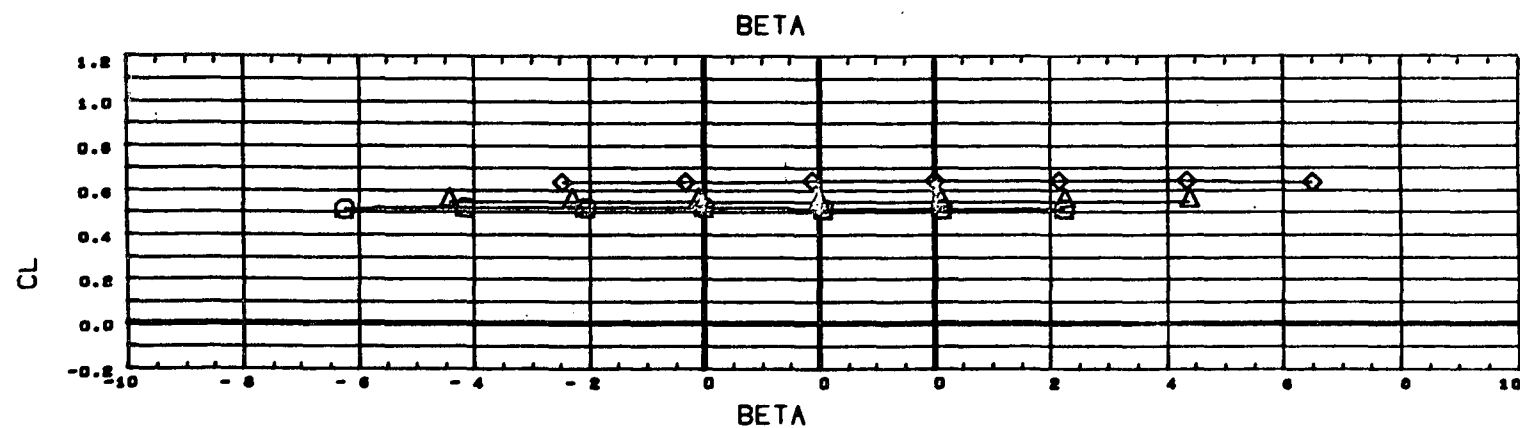
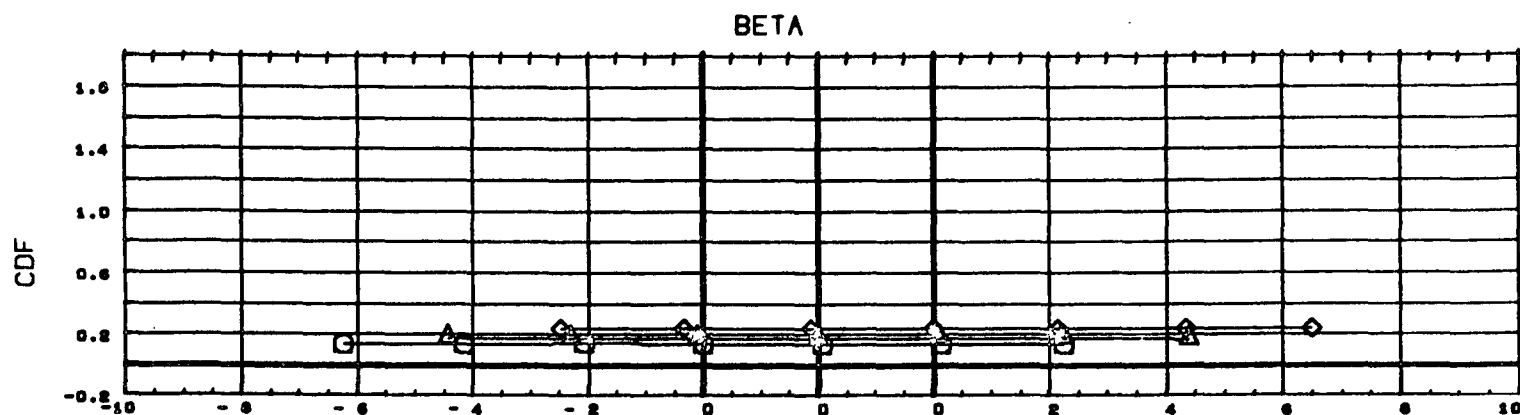
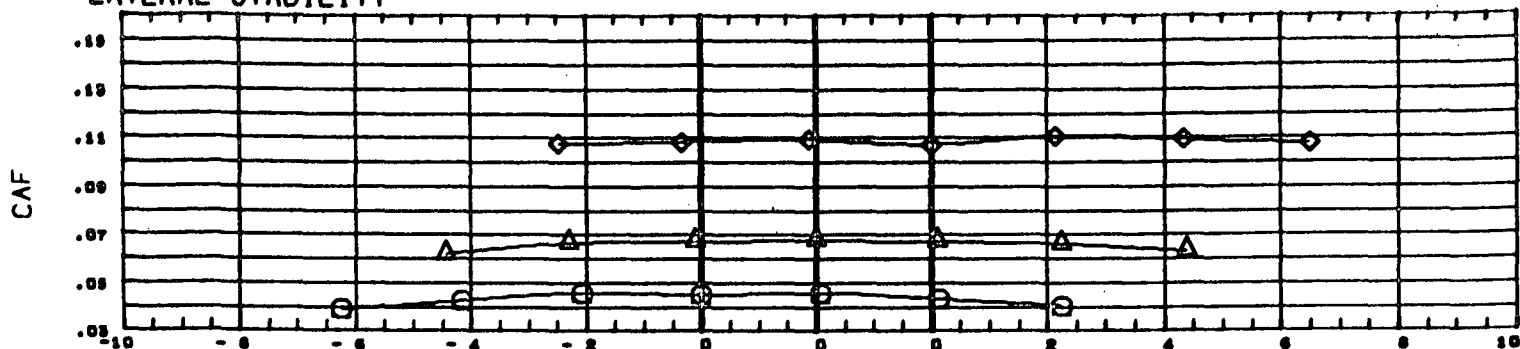
(C5313G)

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LATERAL STABILITY

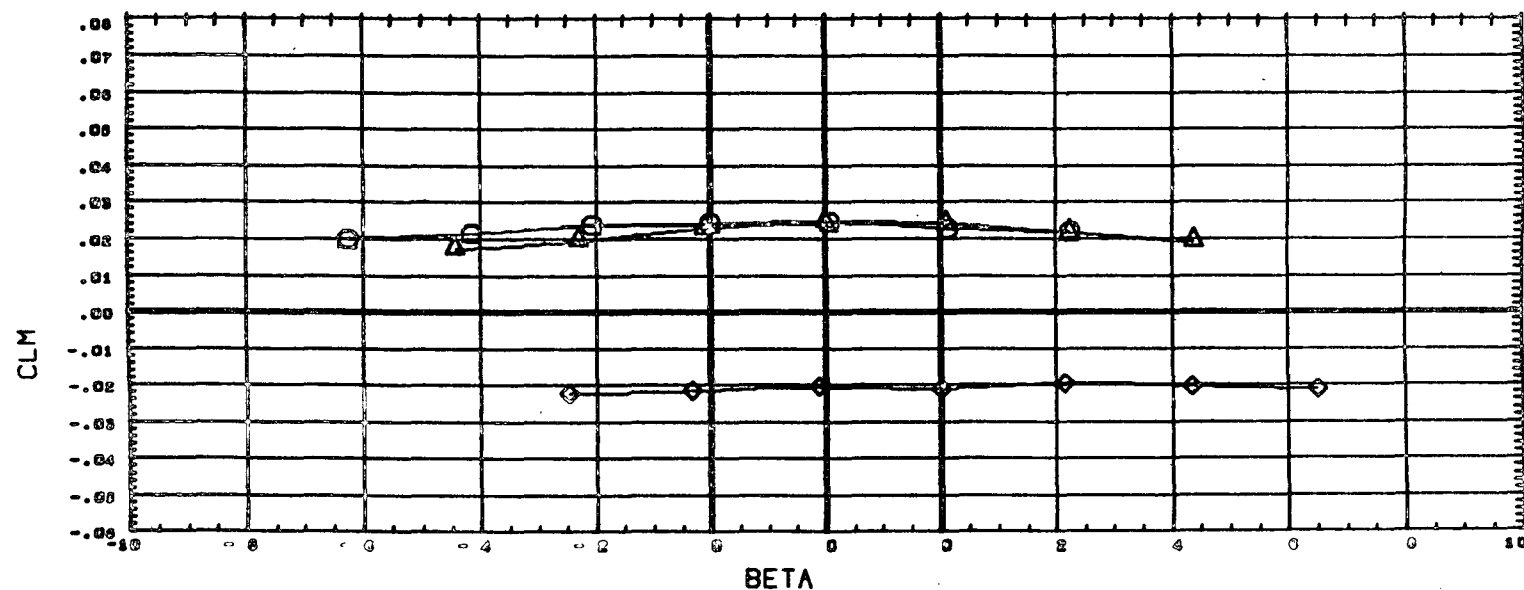
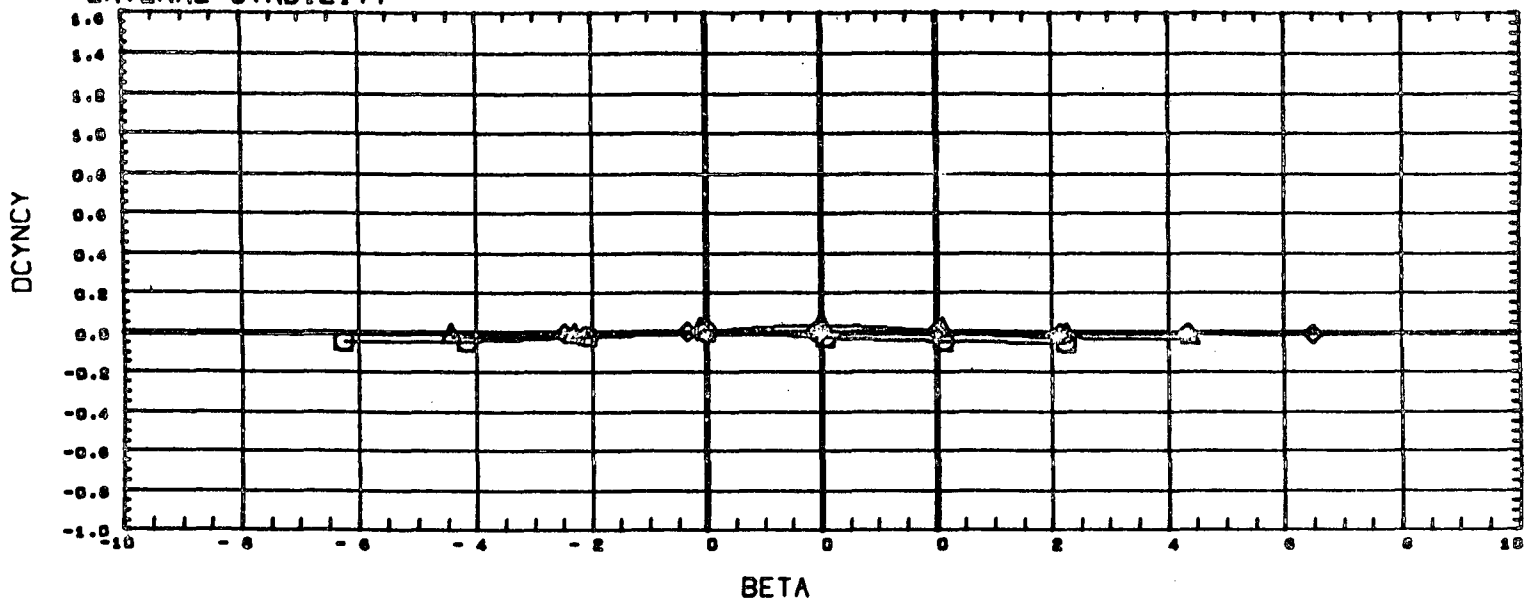


SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	RUDDER	0.000
○	0.601		10.000		
△	0.906	RUDFLR	30.000		
◇	1.200				

REFERENCE INFORMATION		
BREF	14.6836	88. IN.
LREF	4.3060	IN.
BREF	5.6550	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE 6C

LATERAL STABILITY

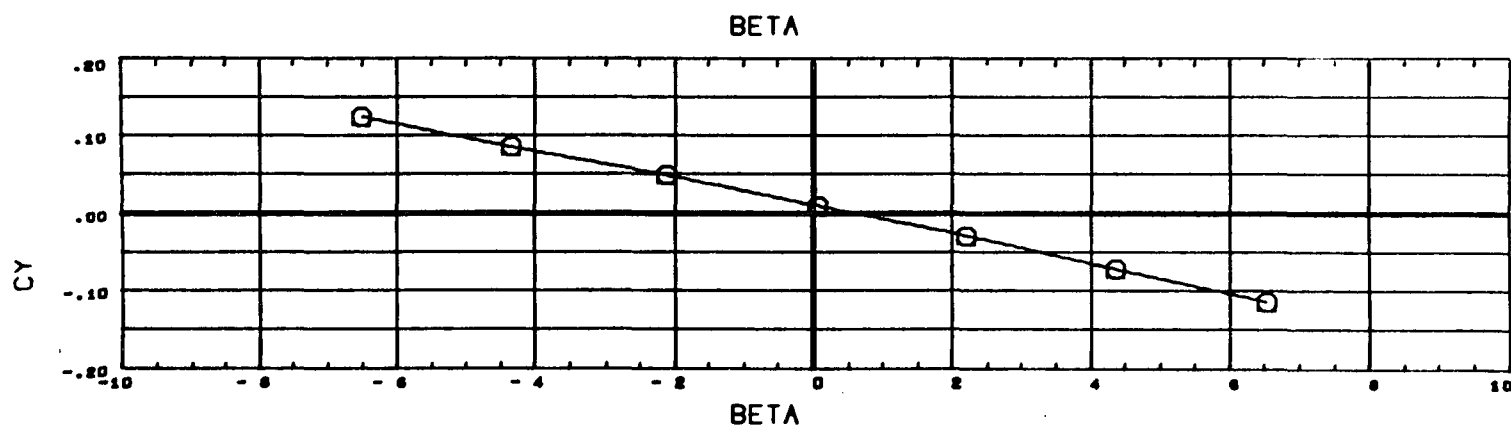
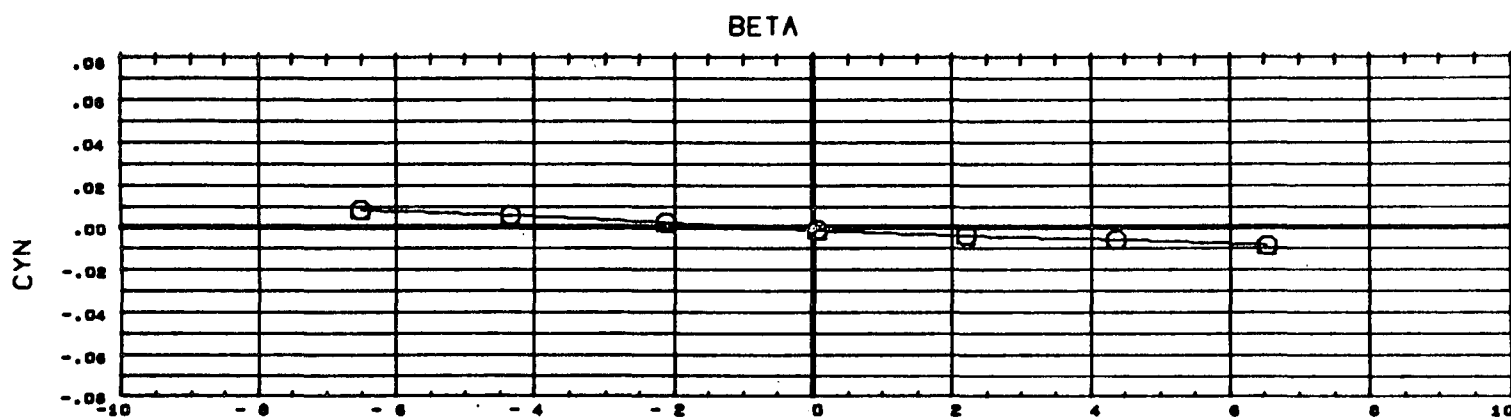
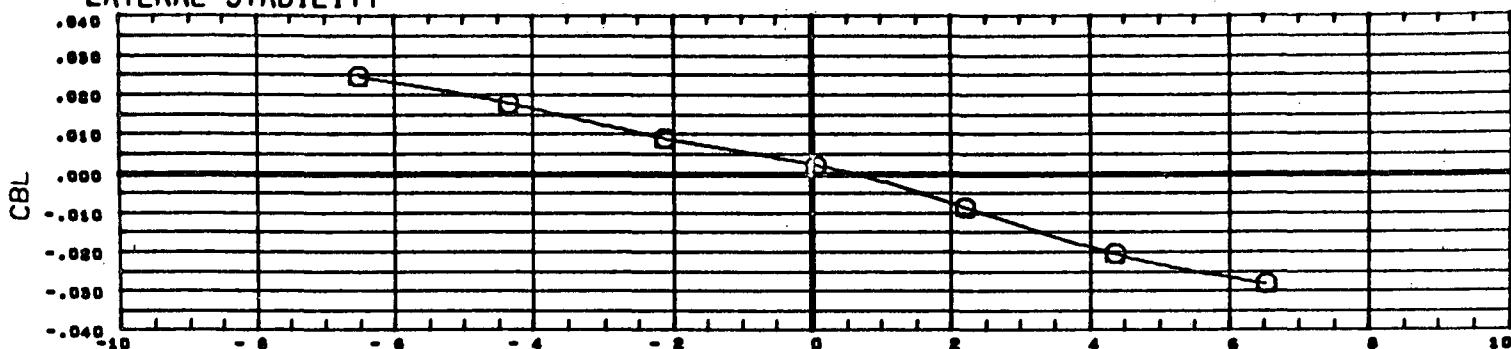


SYMBOL	MACH	PARAMETRIC VALUES
○	0.001	ALPHA 10.000 RUDDER 0.000
△	0.006	RUDFLR 30.000
◇	0.000	

REFERENCE INFORMATION		
SREF	14.6836	80. IN.
LREF	4.9080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE 6C

LATERAL STABILITY



SYMBOL \bigcirc MACH 1.201
 ALPHA 15.000
 RUDPLR 30.000
 PARAMETRIC VALUES
 RUDDER 0.000

REFERENCE INFORMATION
 SREF 14.6836 SQ. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E4A

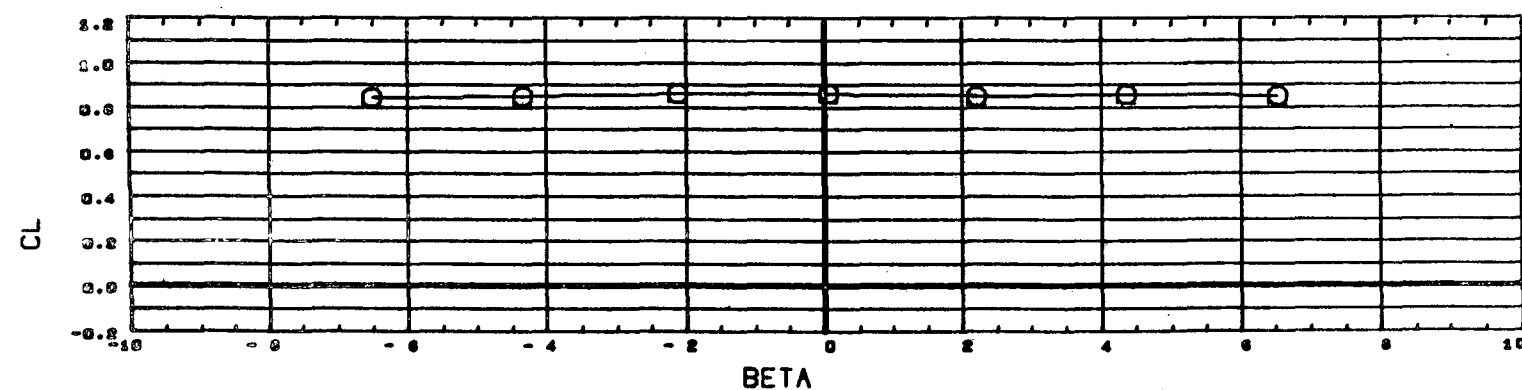
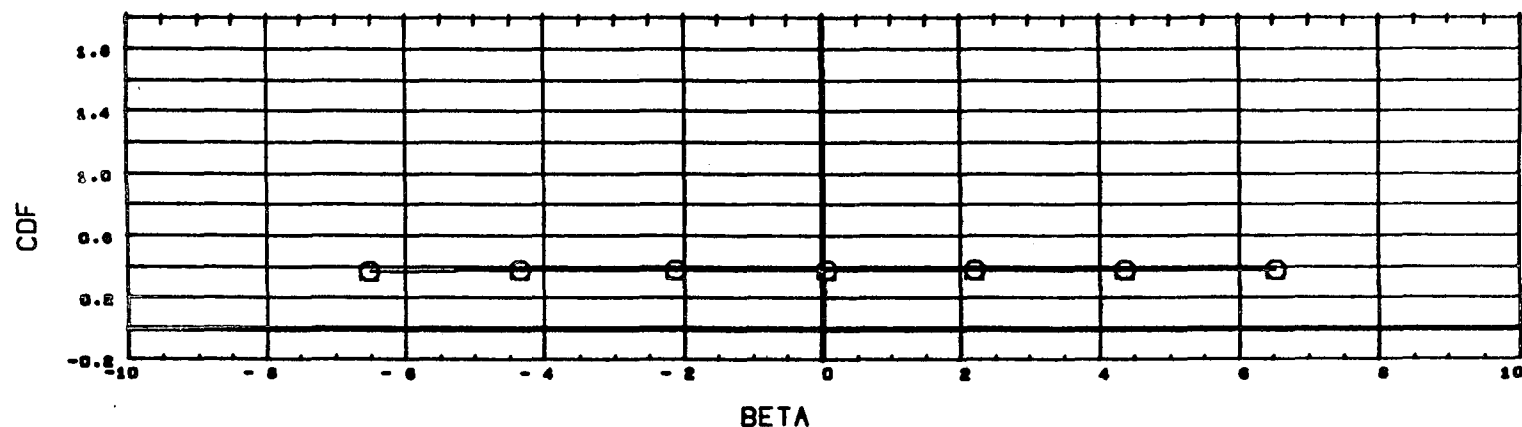
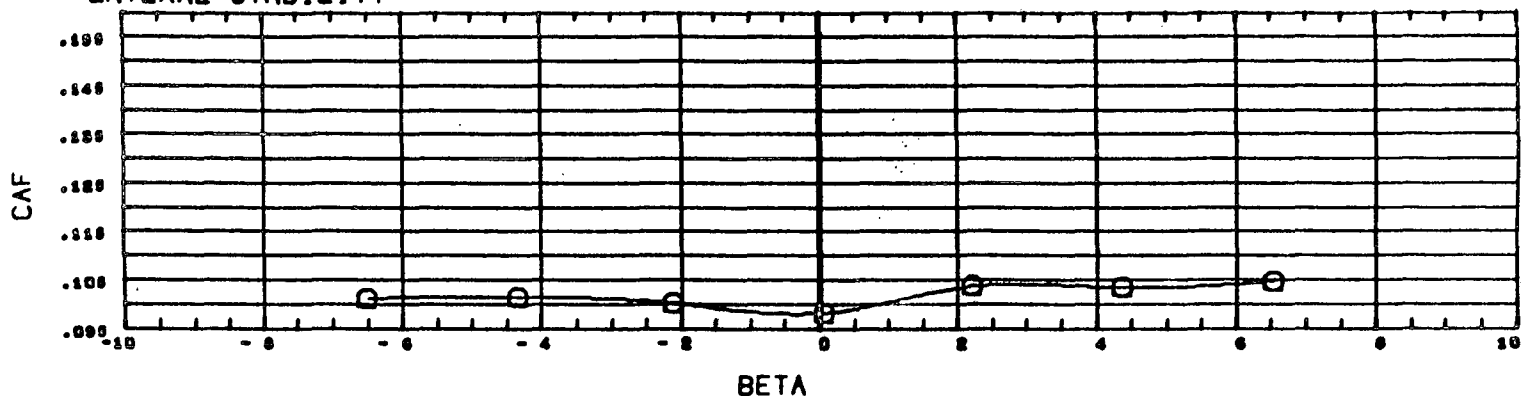
(C5313H)

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LATERAL STABILITY



SYMBOL \square MACH 3.201
 PARAMETRIC VALUES
 ALPHA 15.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 89. IN.
 LREF 4.5080 IN.
 BREF 8.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E4A

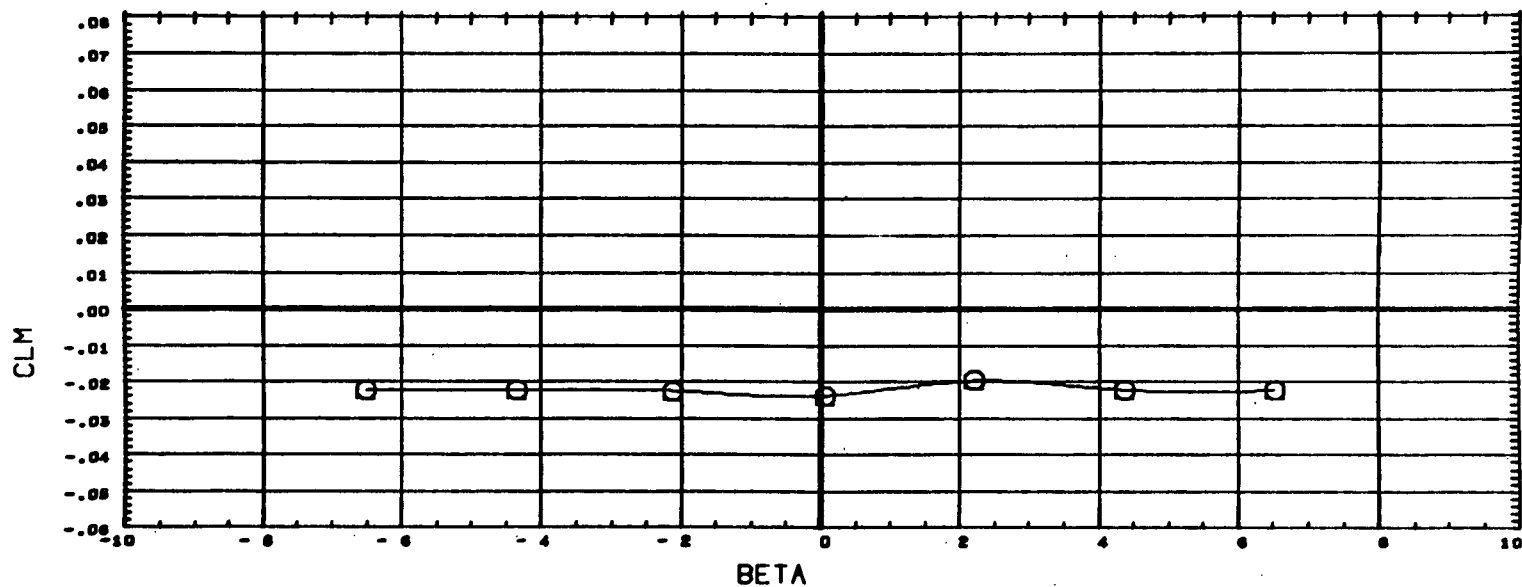
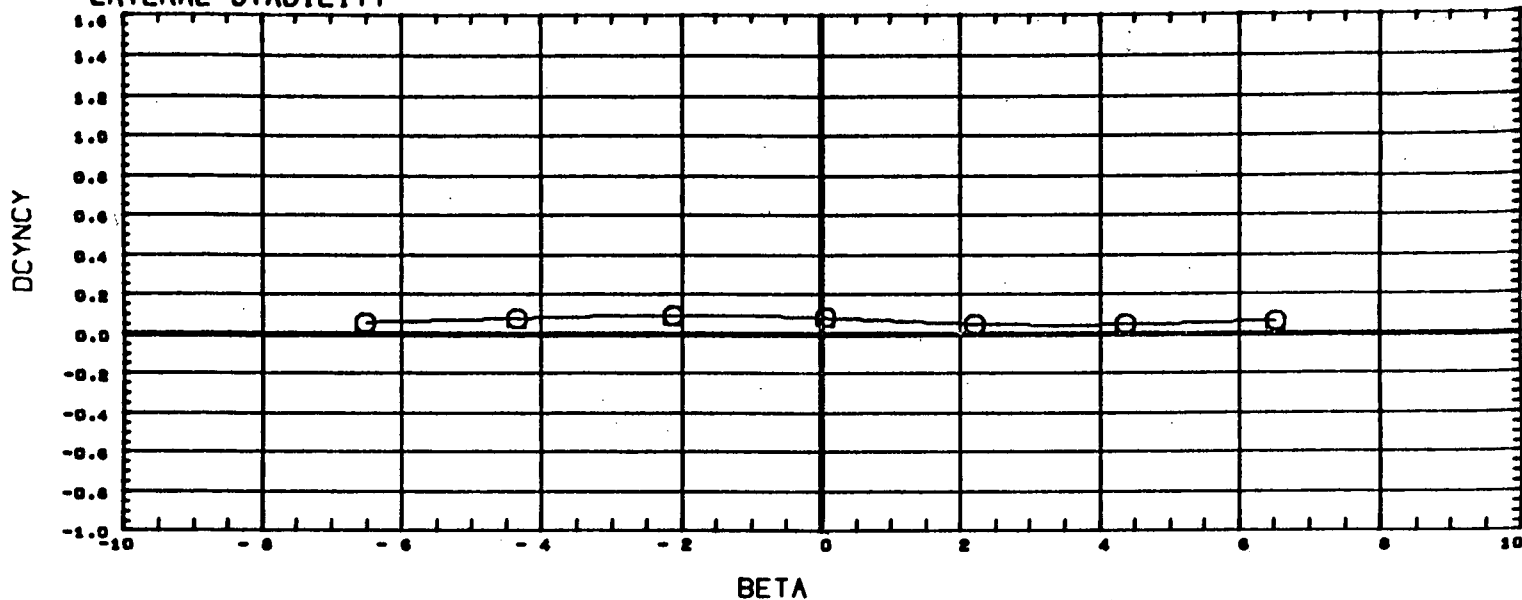
(C5313H)

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LATERAL STABILITY

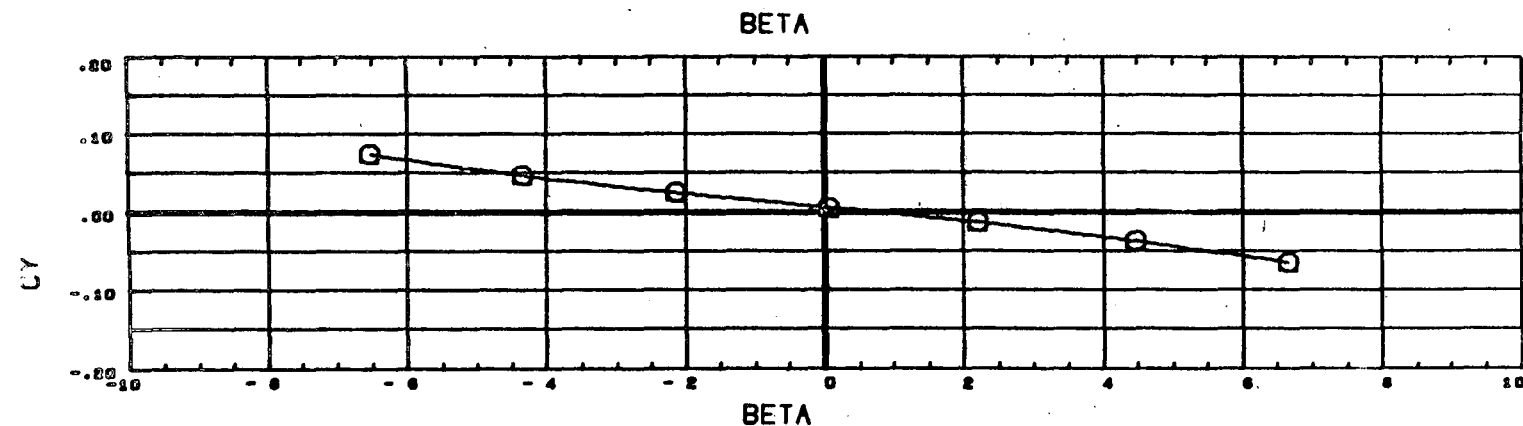
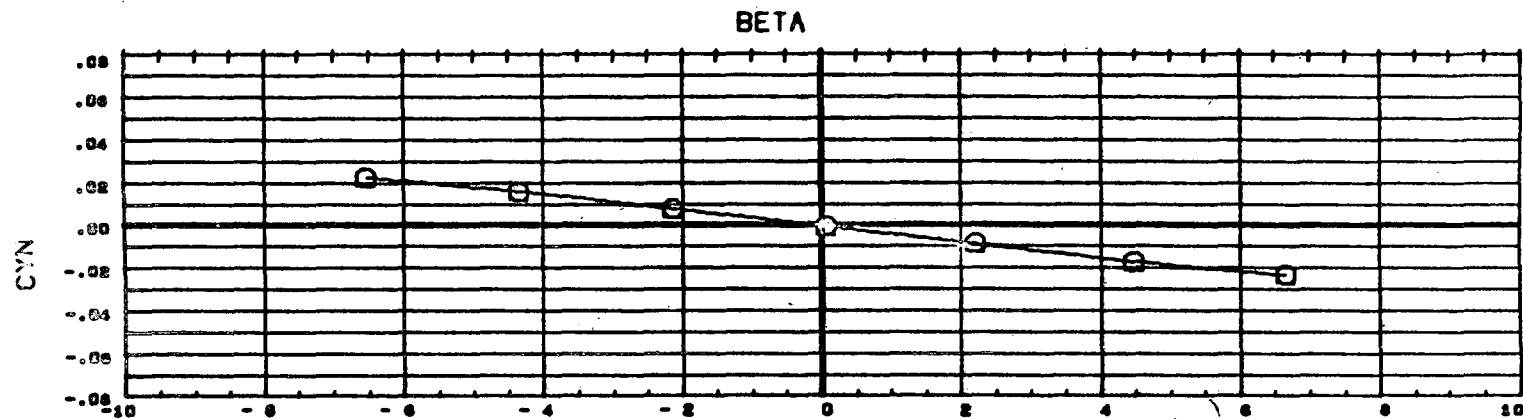
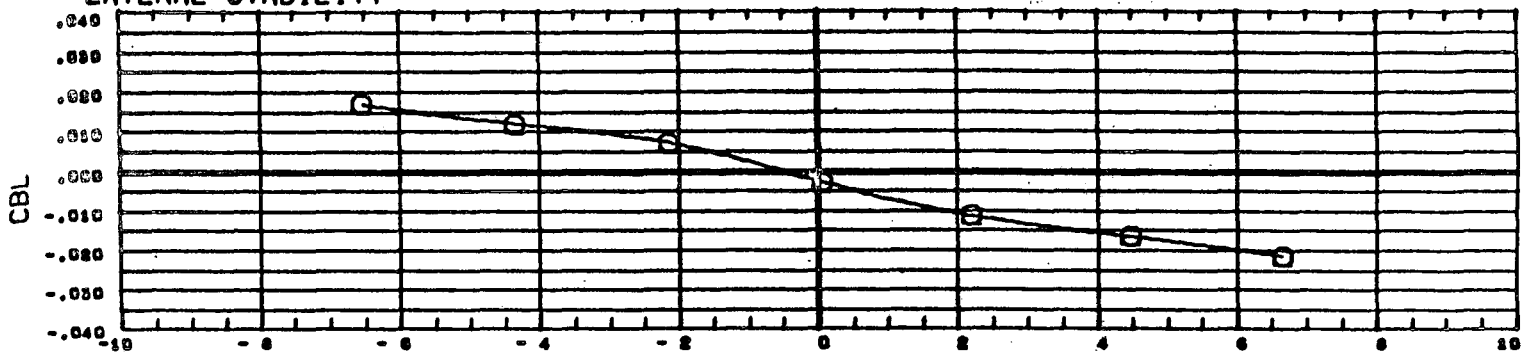


SYMBOL	MACH	PARAMETRIC VALUES		
○	1.201	ALPHA	15.000	RUDDER 0.000
		RUDFLR	30.000	

REFERENCE INFORMATION		
SREF	14.6836	89. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE 6C

LATERAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 O 1.970 ALPHA 25.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 BRP 14.6836 80. IN.
 LREF 4.5080 IN.
 BRP 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

M513-MSFC MODELAR1216I-2

B5CW11AF2S1V7E4A

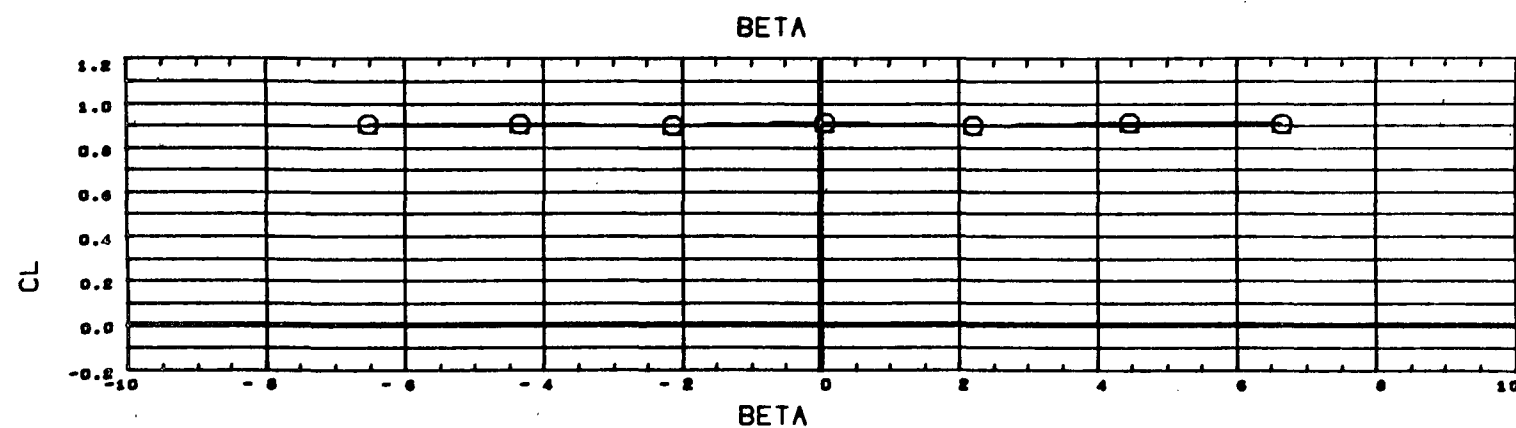
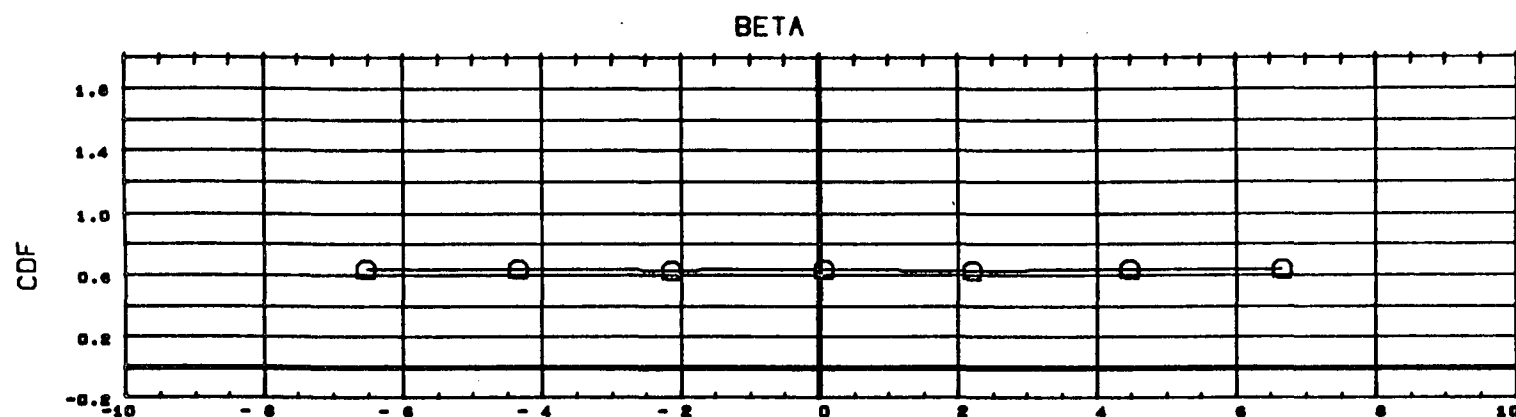
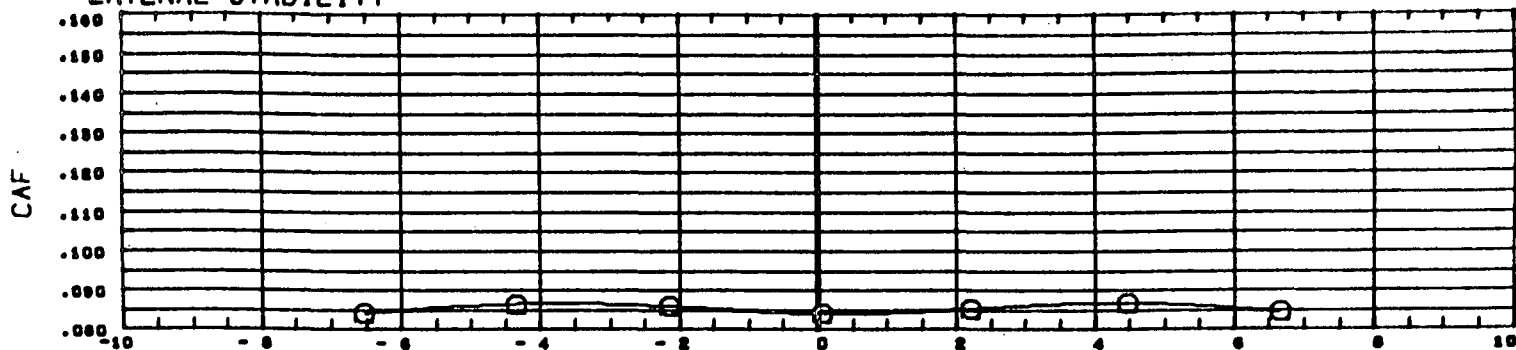
(C5313L)

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LATERAL STABILITY

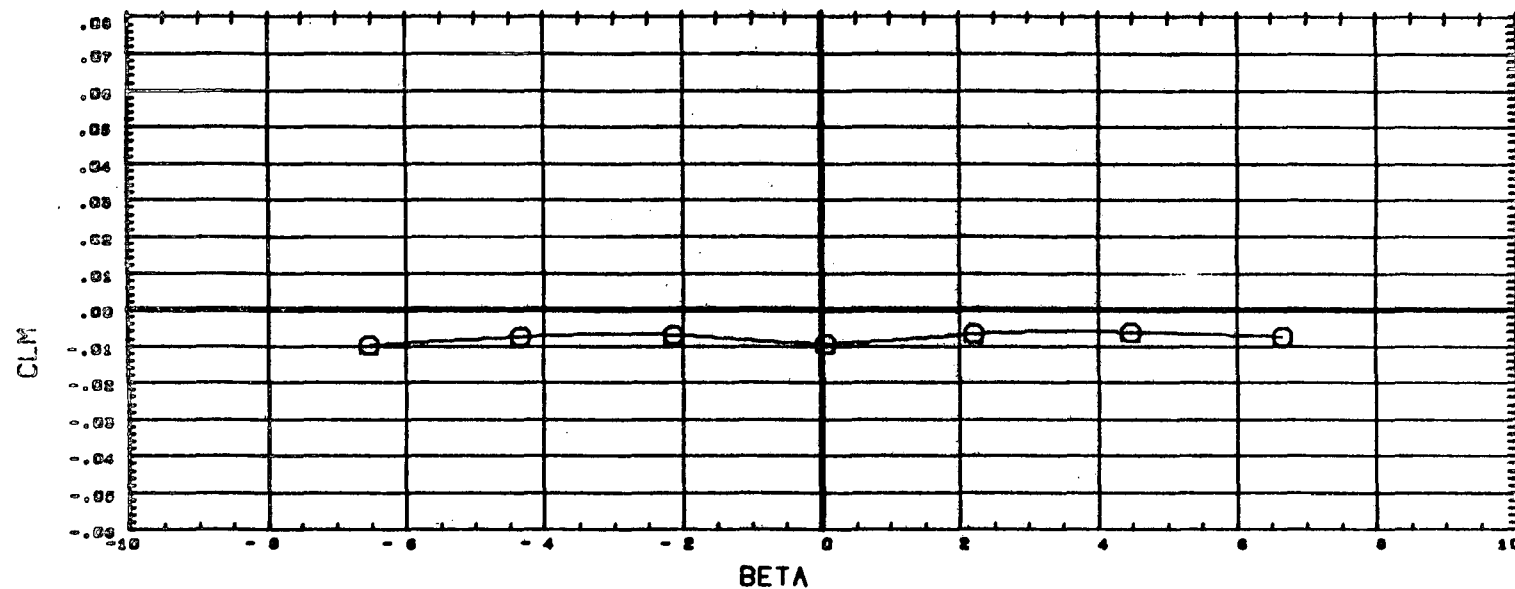
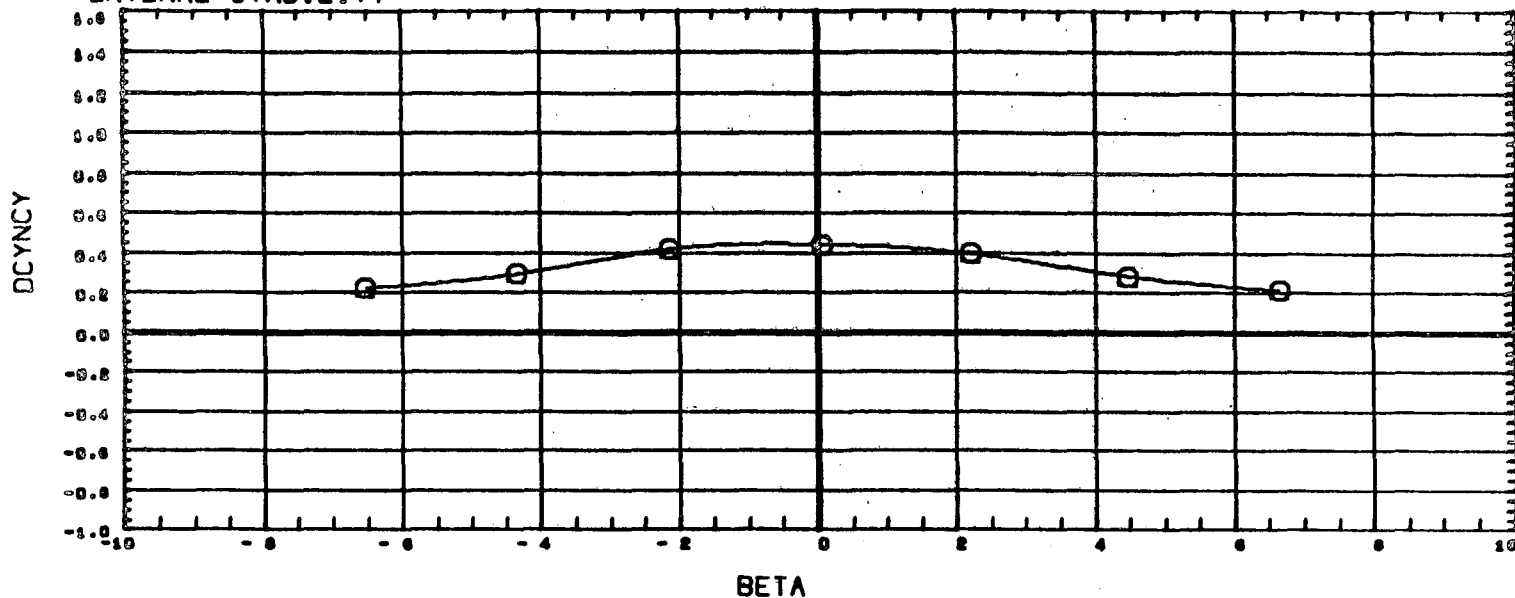


SYMBOL MACH PARAMETRIC VALUES
 O 1.970 ALPHA 25.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 89. IN.
 LREF 4.5060 IN.
 SREF 5.6550 IN.
 XMRP 1.4021 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

LATERAL STABILITY

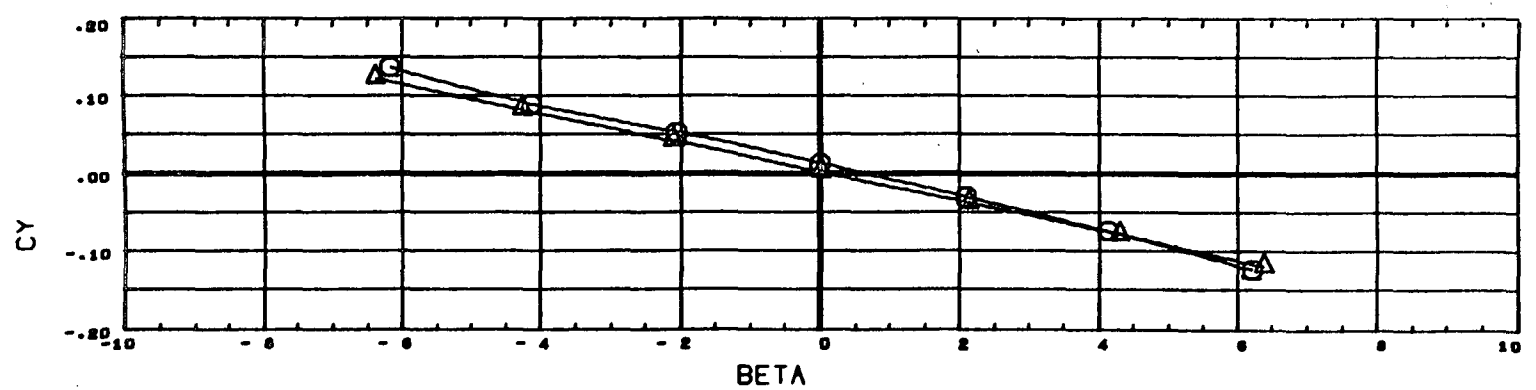
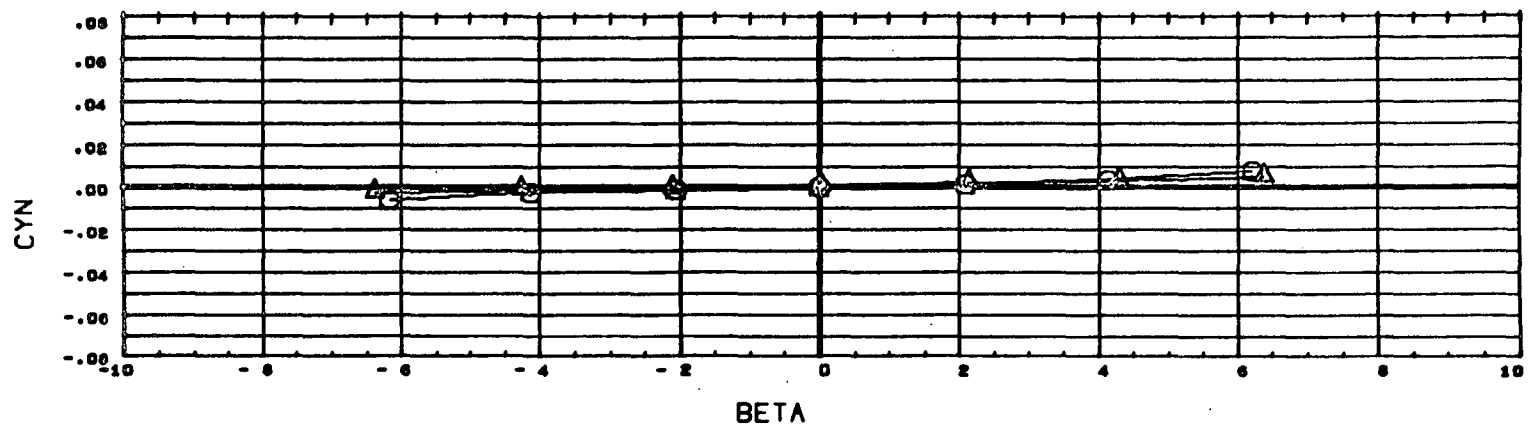
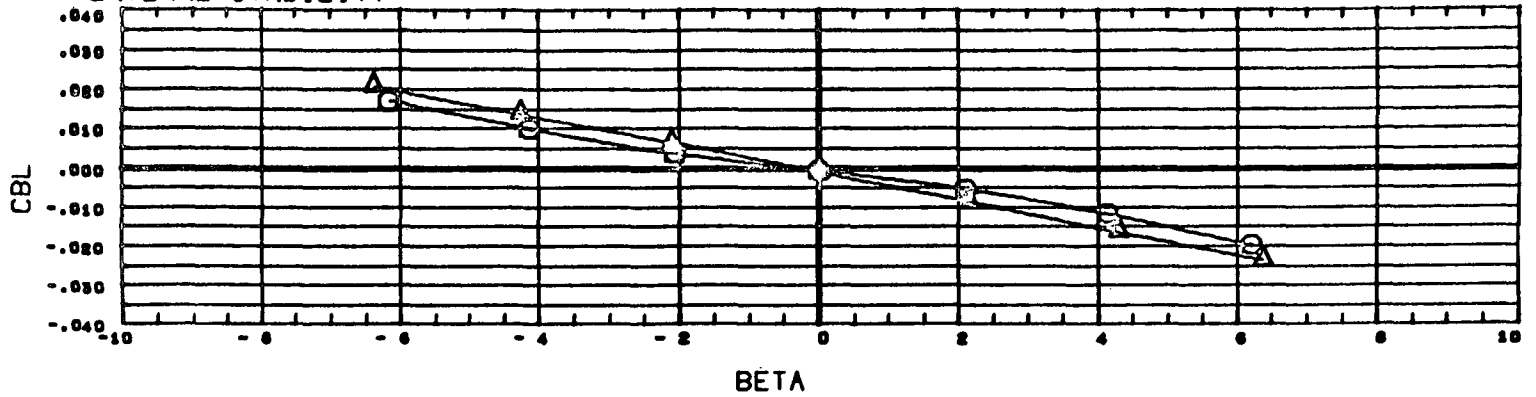


SYMBOL \square MACH 1.970
 PARAMETRIC VALUES
 ALPHA 25.000 RUDDER 0.000
 RUDDLR 30.000

REFERENCE INFORMATION
 SREF 14.6636 SQ. IN.
 LREF 4.5080 IN.
 BREF 9.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

LATERAL STABILITY

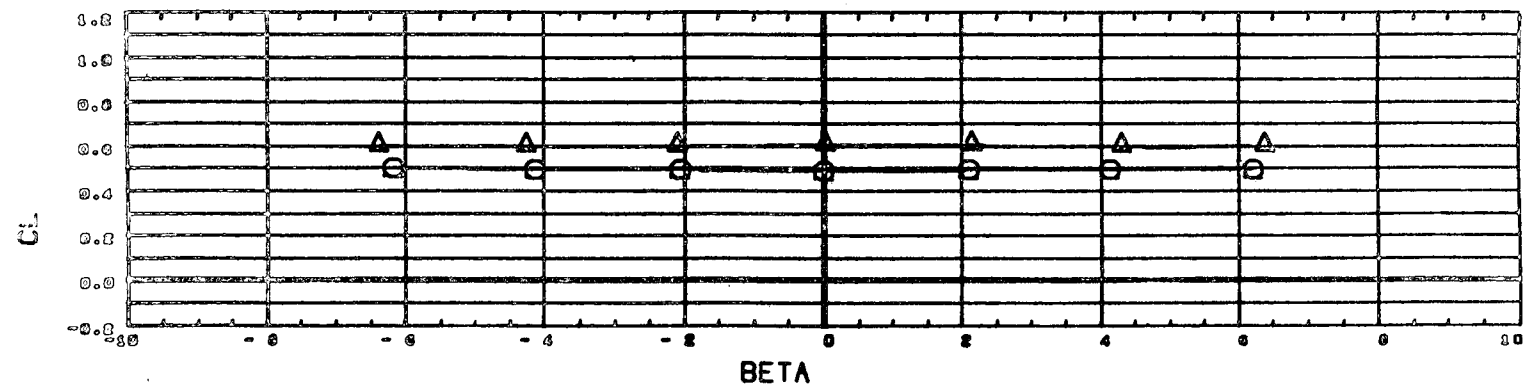
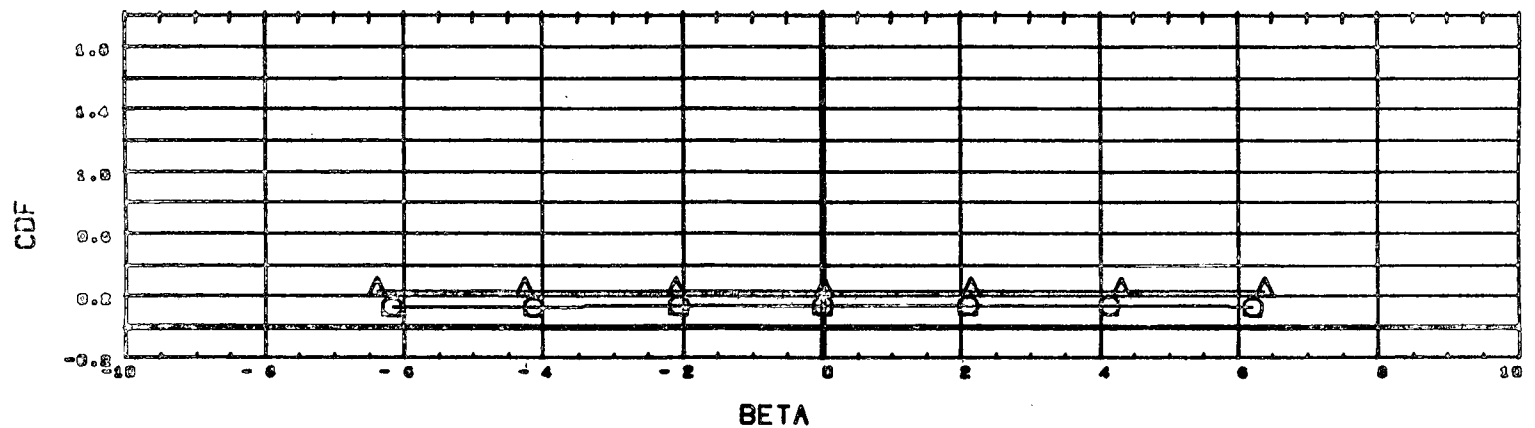
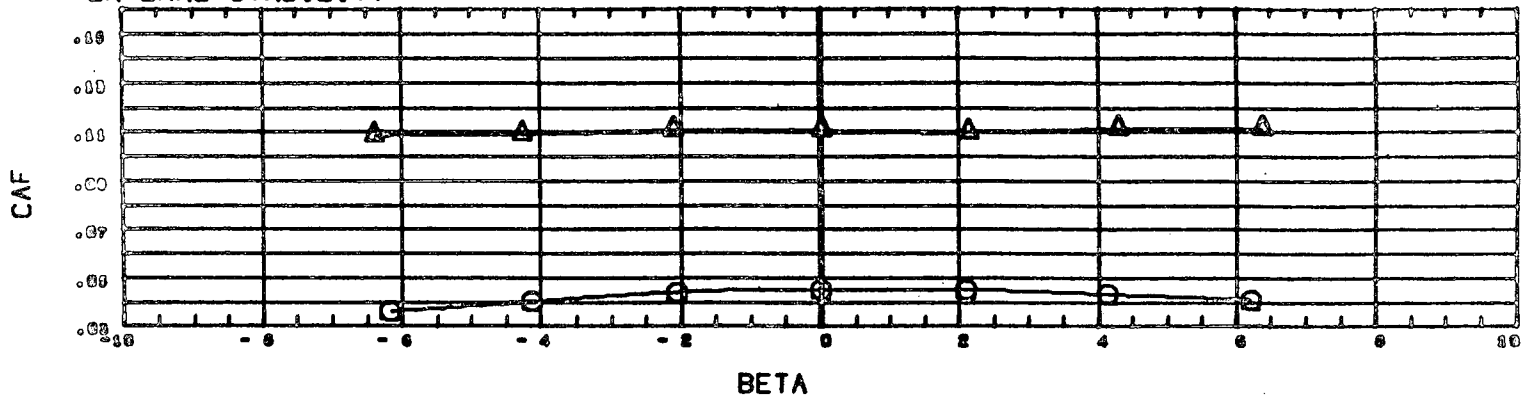


SYMBOL	MACH	PARAMETRIC VALUES			
△	0.000	ALPHA	10.000	RUDDER	0.000
○	0.100	RUDFLR	30.000		

REFERENCE INFORMATION		
SREF	14.6036	80. IN.
LREF	4.5060	IN.
BREF	9.6590	IN.
XMRP	1.4621	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE 6C

LATERAL STABILITY

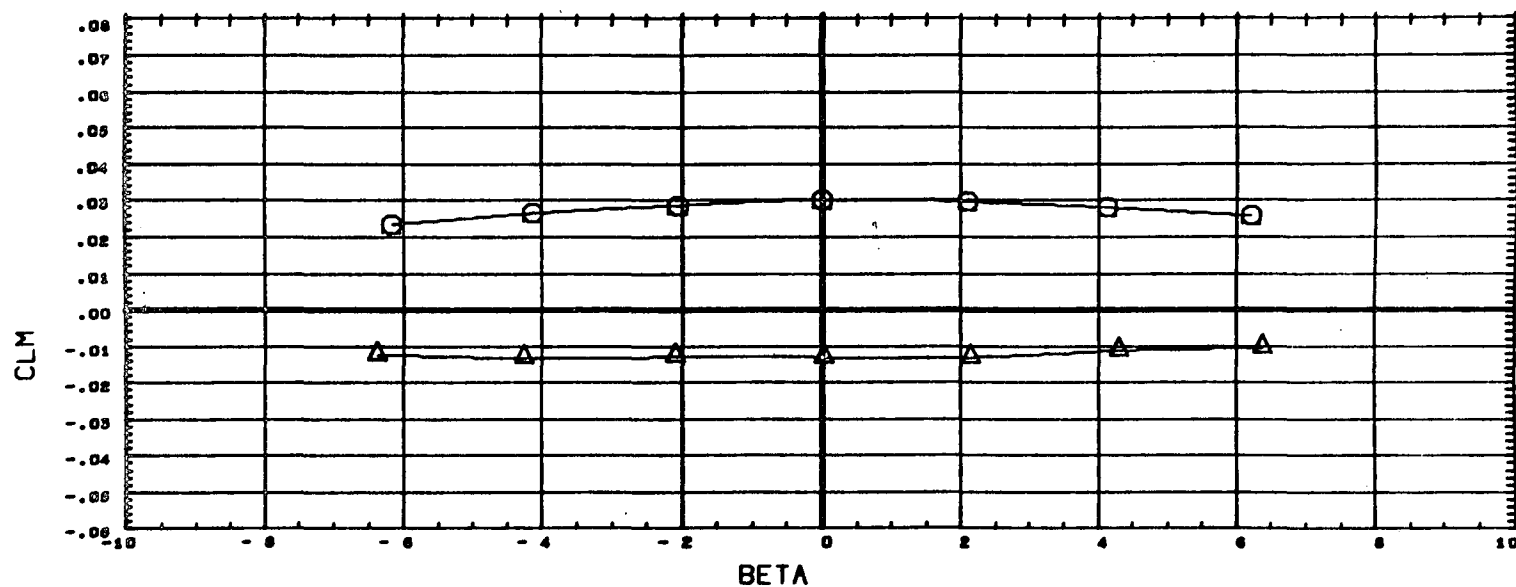
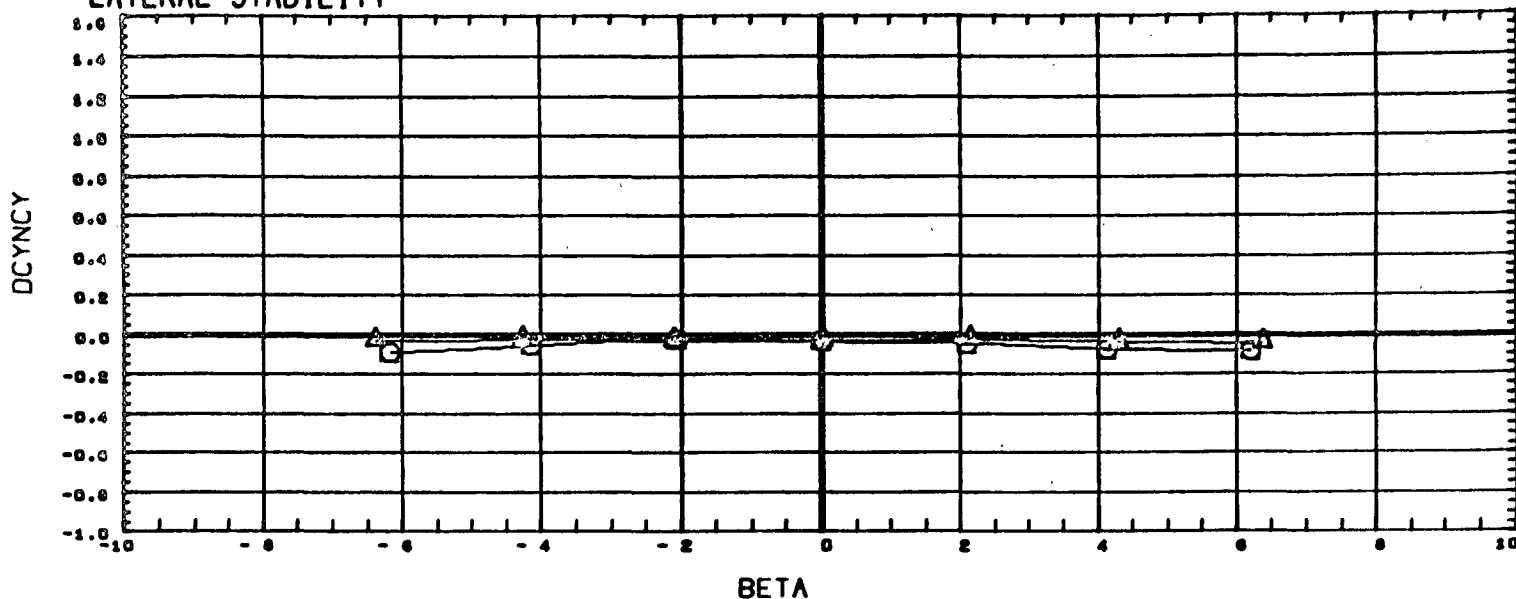


SYMBOL	WACH	PARAMETRIC VALUES			
○	0.000	ALPHA	10.000	RUDDER	0.000
△	1.199	RUDDLR	30.000		

REFERENCE INFORMATION		
SREF	14.8830	80. IN.
LREF	4.5000	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE 6C

LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	0.600	ALPHA	10.000	RUDDER	0.000
△	1.190	RUDFLR	30.000		

REFERENCE INFORMATION		
SREF	14.6836	80. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

M513-MSFC MODELAR12161-2

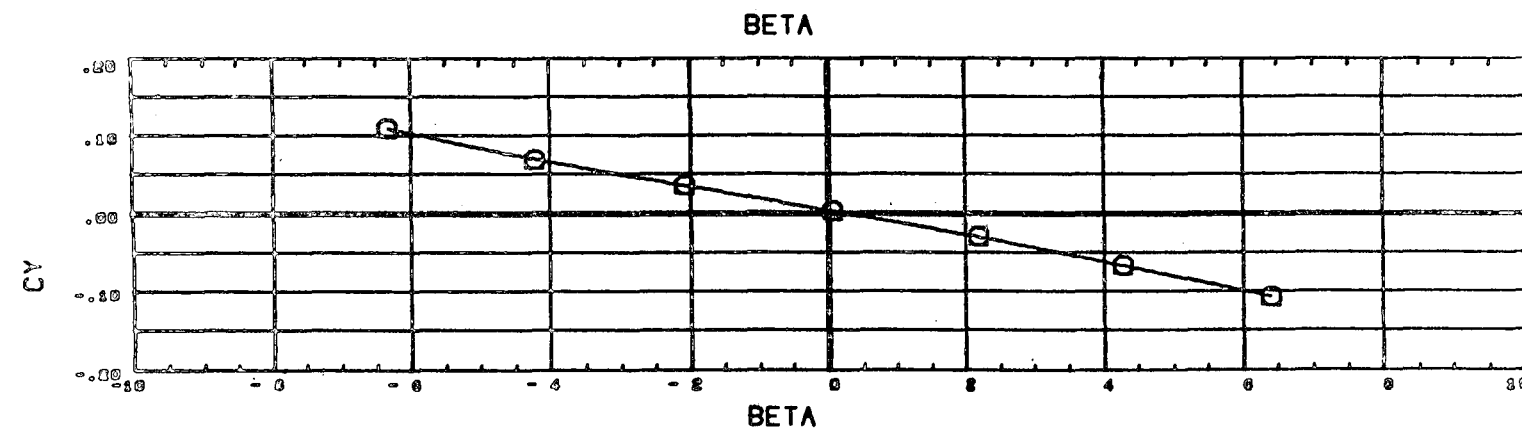
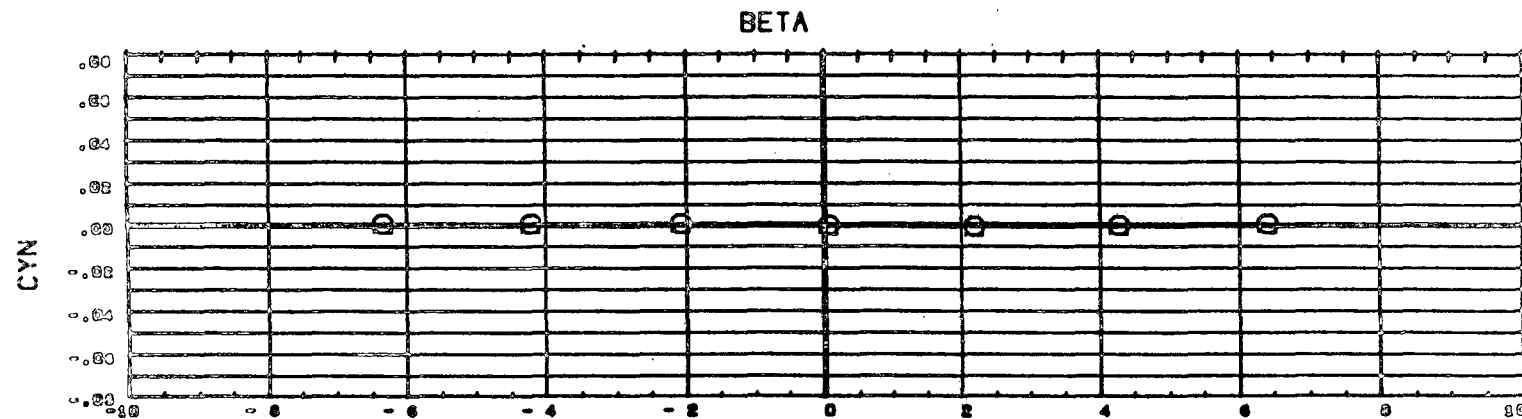
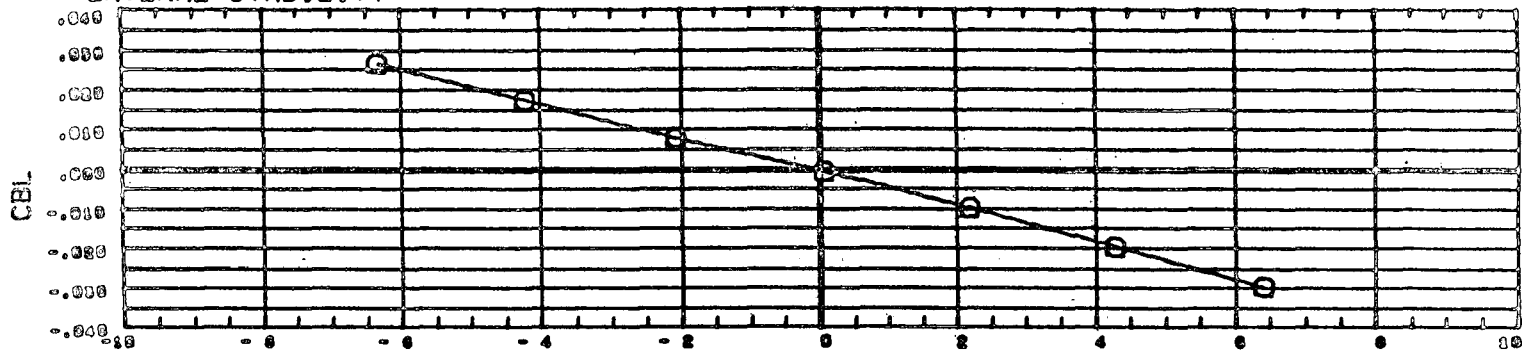
B5CW11AF2S1V7E2C3 (C5308G)

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LATERAL STABILITY

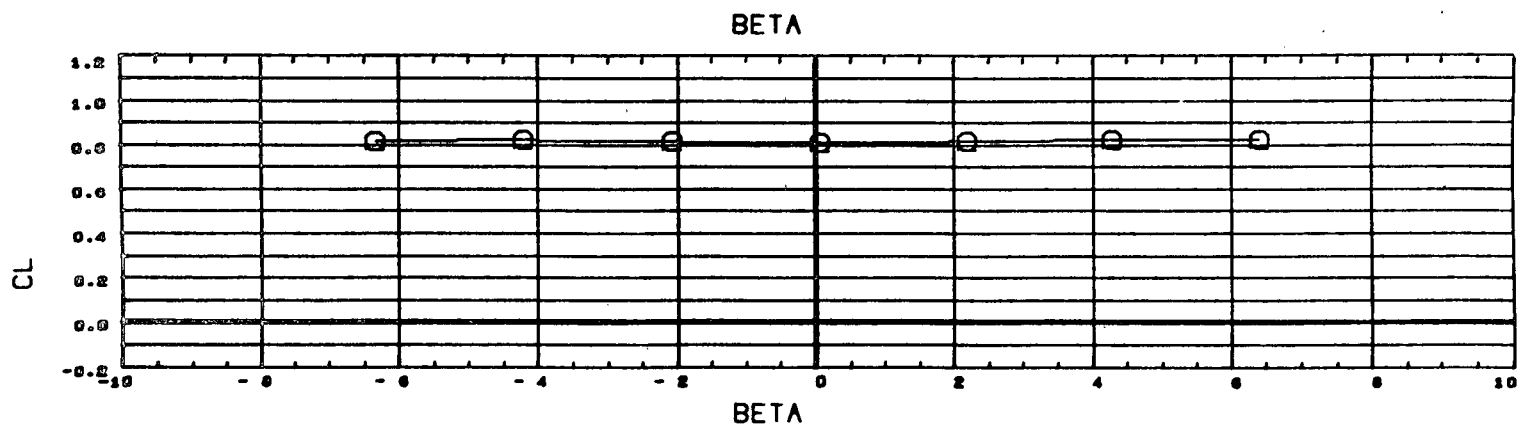
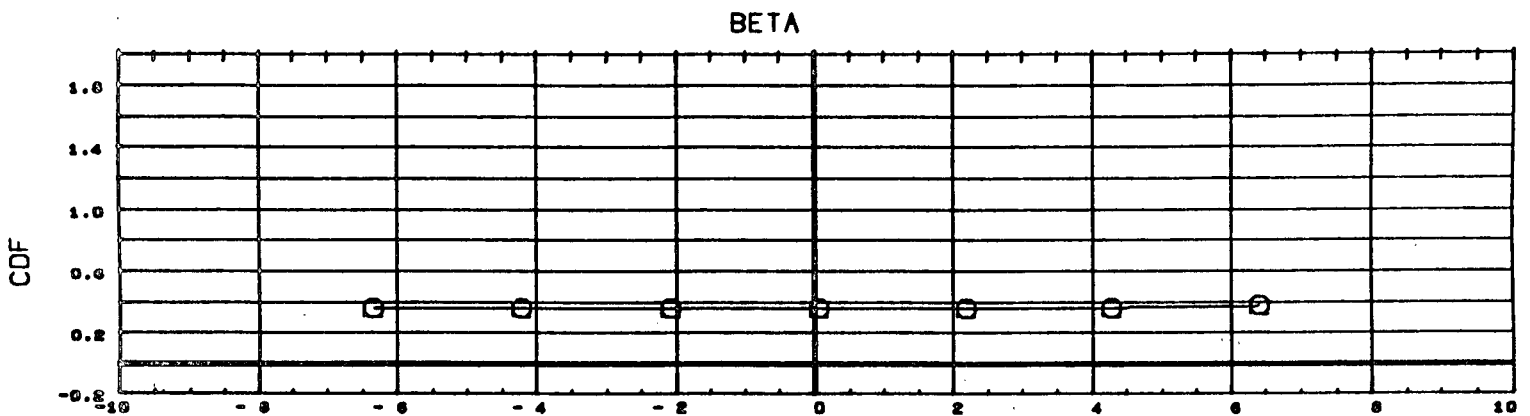
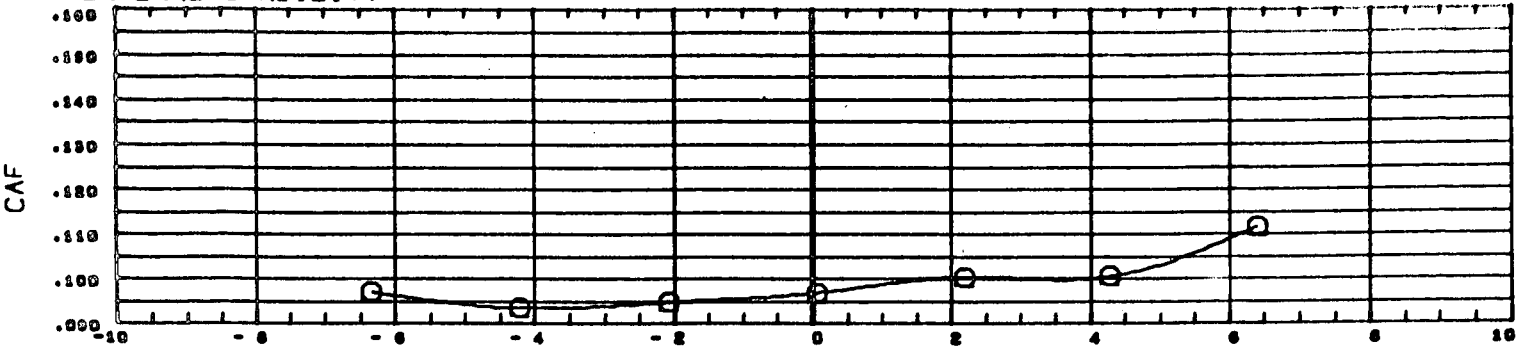


SYMBOL	NACH	PARAMETRIC VALUES			
○	1.201	ALPHA	15.000	RUDDER	0.000
		RU9FLR	30.000		

REFERENCE INFORMATION		
SREF	14.6036	CG. IN.
LREF	4.9000	IN.
BREF	5.6550	IN.
XMRP	1.4021	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

LATERAL STABILITY



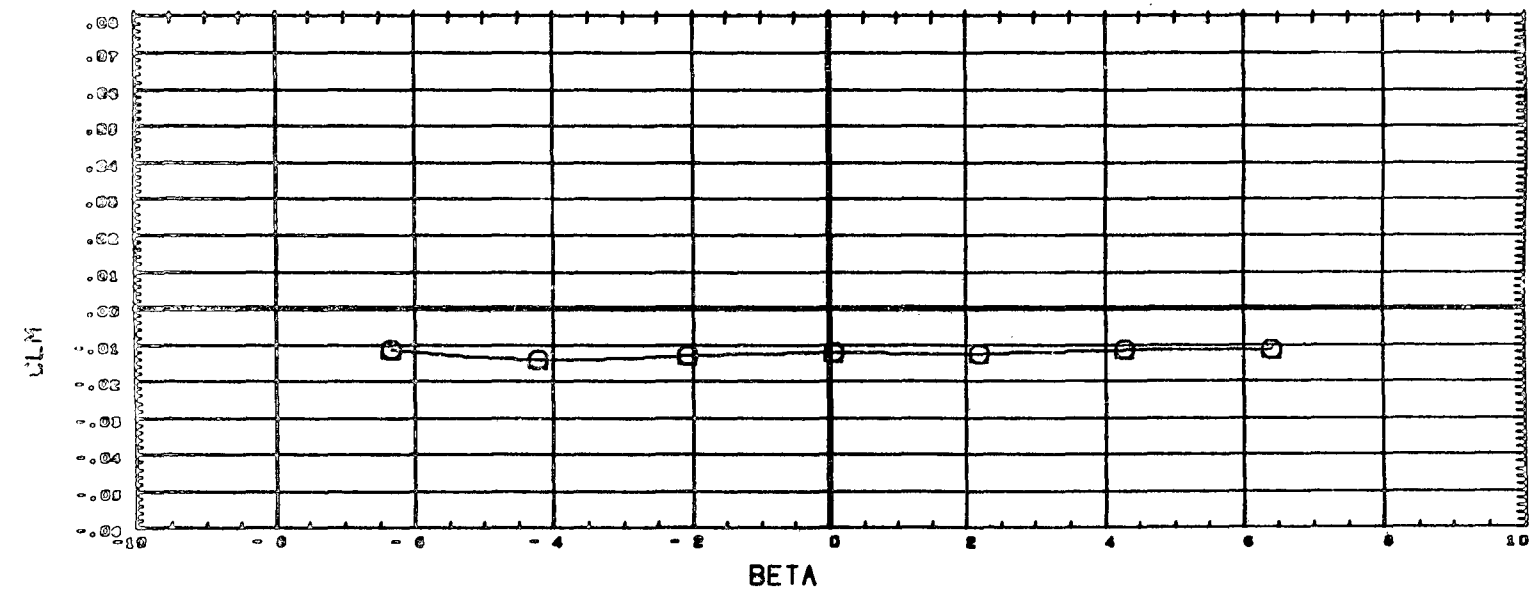
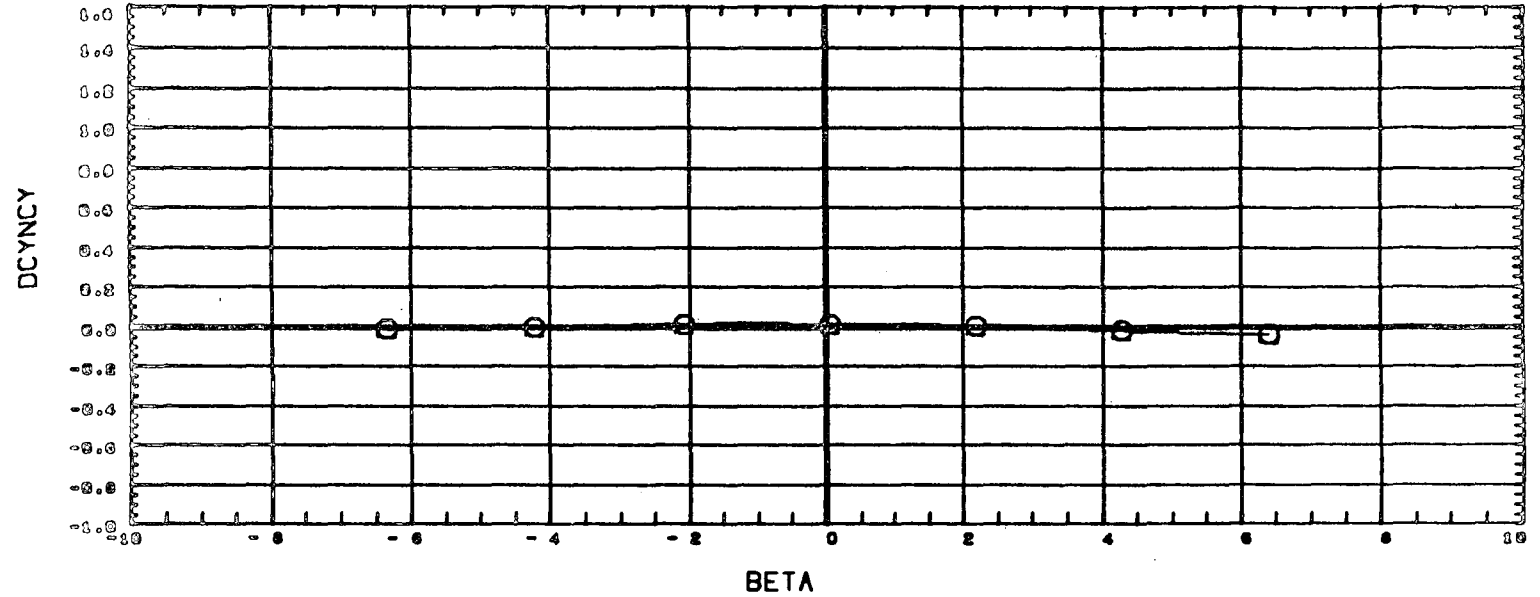
SYMBOL HACH
O 1.201

PARAMETRIC VALUES
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RUDFLR 30.000

REFERENCE INFORMATION
SREF 14.8836 89. IN.
LREF 4.5080 IN.
BREF 9.6550 IN.
XMRP 1.4821 IN.
YMRP 0.0000 IN.
ZMRP 0.0000 IN.
SCALE 0.0034

DATA HIST. CODE 6C

LATERAL STABILITY



SYMBOL \bigcirc MACH 1.001
 PARAMETRIC VALUES
 ALPHA 15.000 RUDDER 0.000
 RUDDLER 30.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

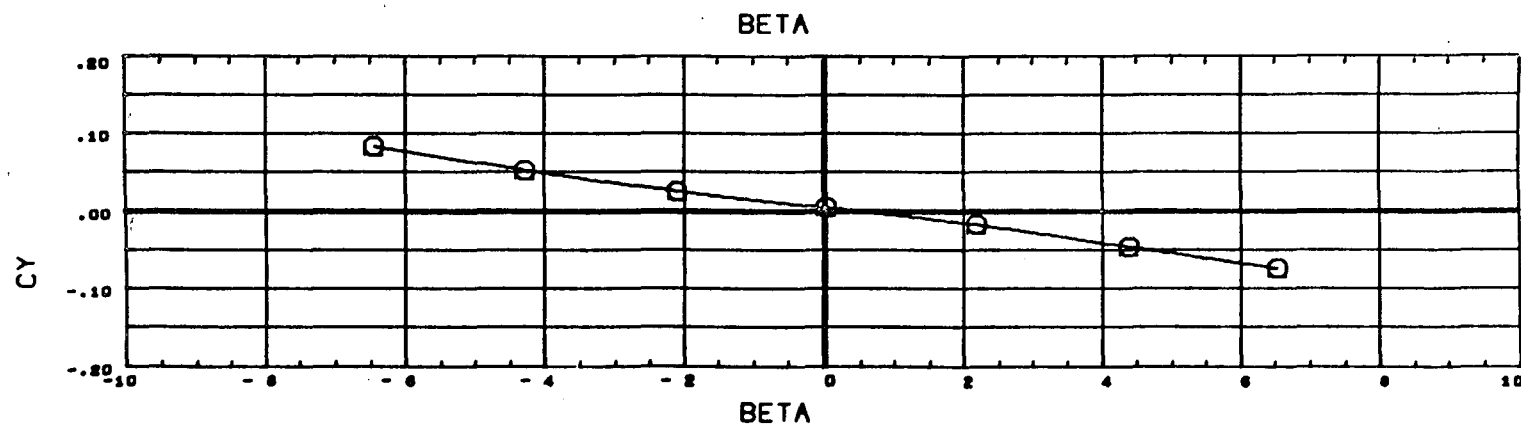
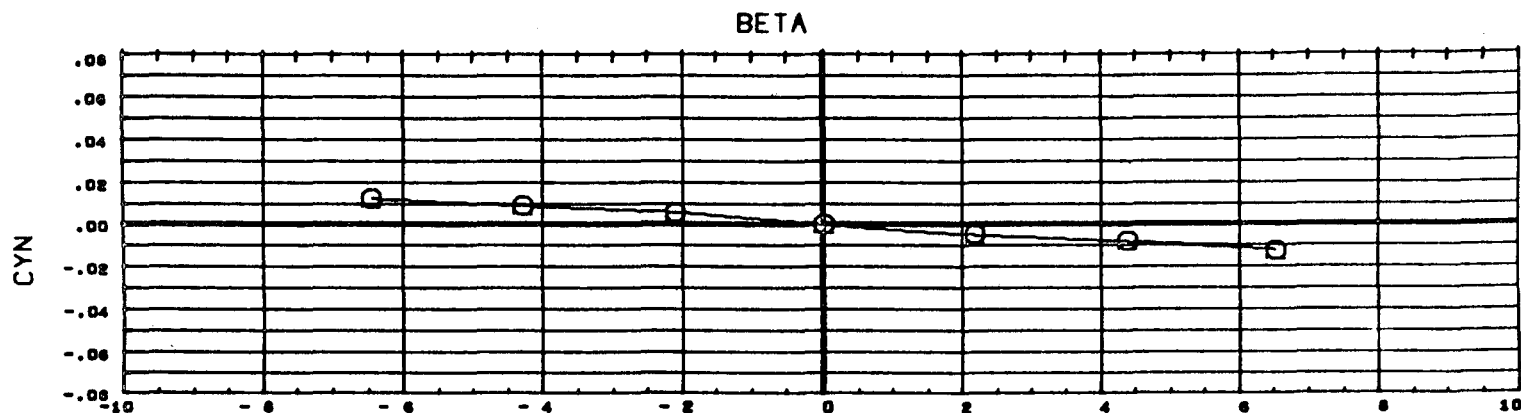
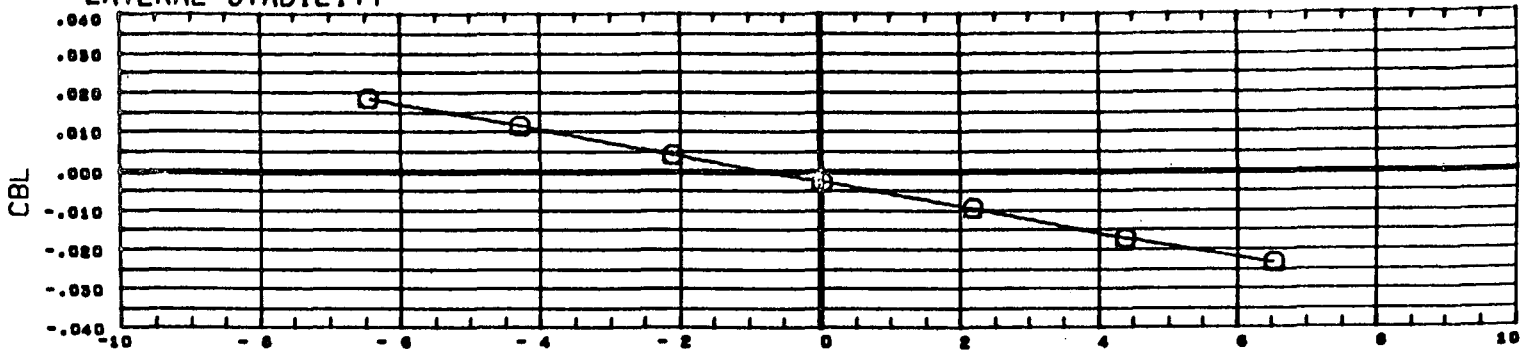
MS13-MSFC MODELAR1216I-2

B5CW11AF2S1V7E2C3 (C5308H)

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LATERAL STABILITY

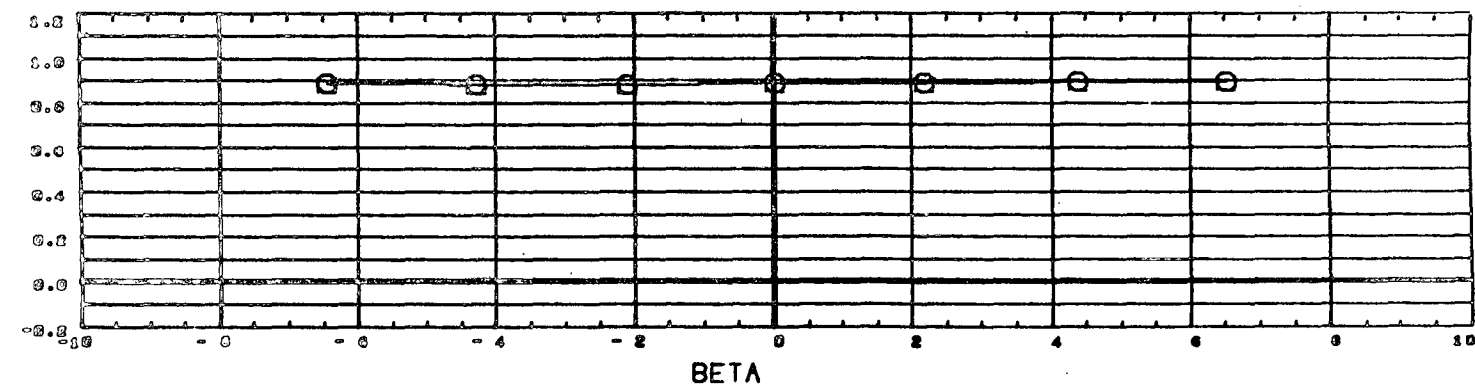
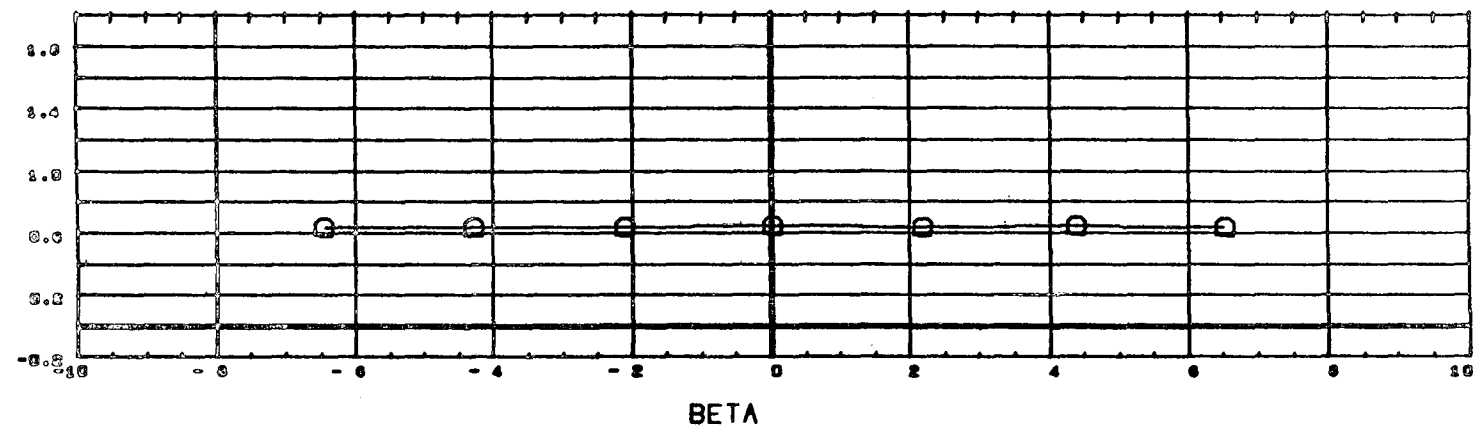
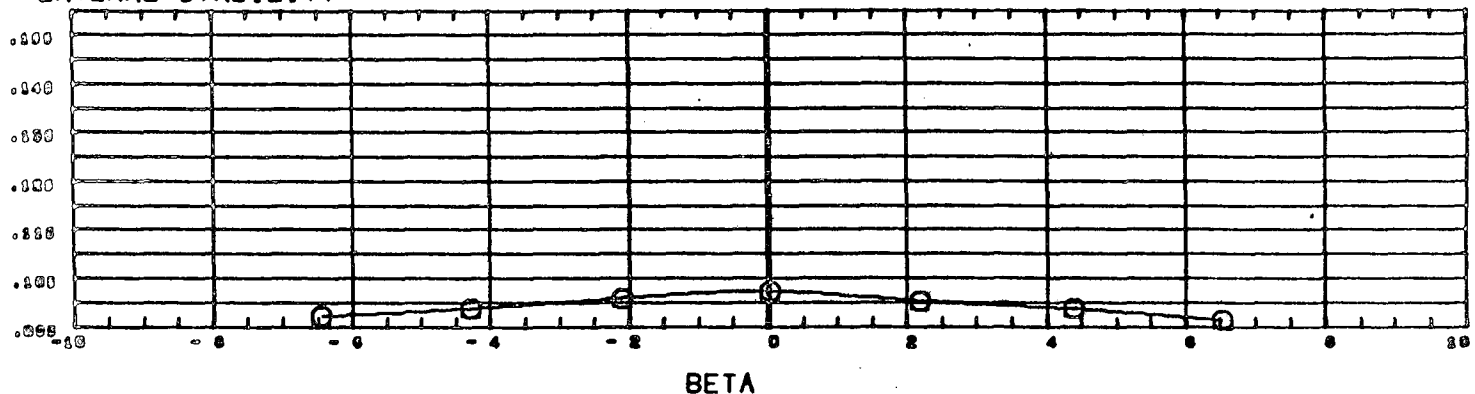


SYMBOL \square MACH 1.966 ALPHA 25.000 RUDDER 0.000
RUDFLR 30.000

REFERENCE INFORMATION
SREF 14.6836 30.IN.
LREF 4.5080 IN.
BREF 3.6950 IN.
XMRP 1.4821 IN.
YMRP 0.0000 IN.
ZMRP 0.0000 IN.
SCALE 0.0034

DATA HIST. CODE 6C

LATERAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 O 1.060 ALPHA 25.000 RUDDER 0.000
 RUDDLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 30. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA IDENT. CODE 6C

M513-MSFC MODELAR12161-2

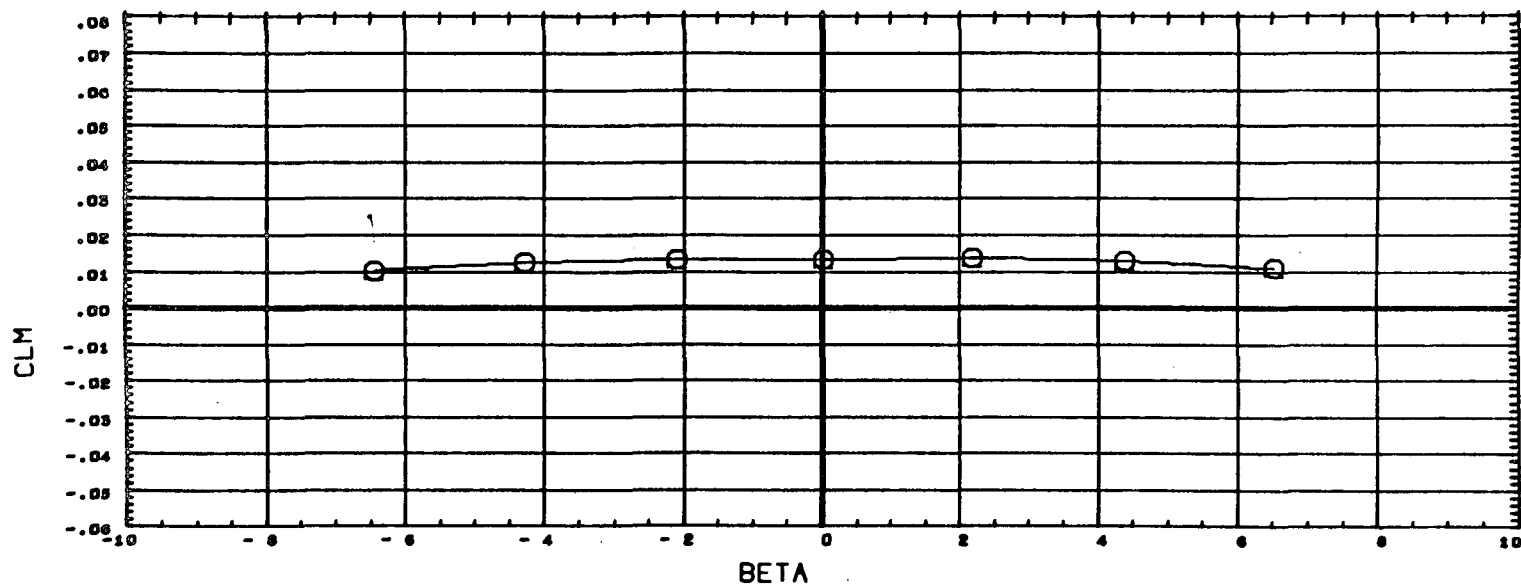
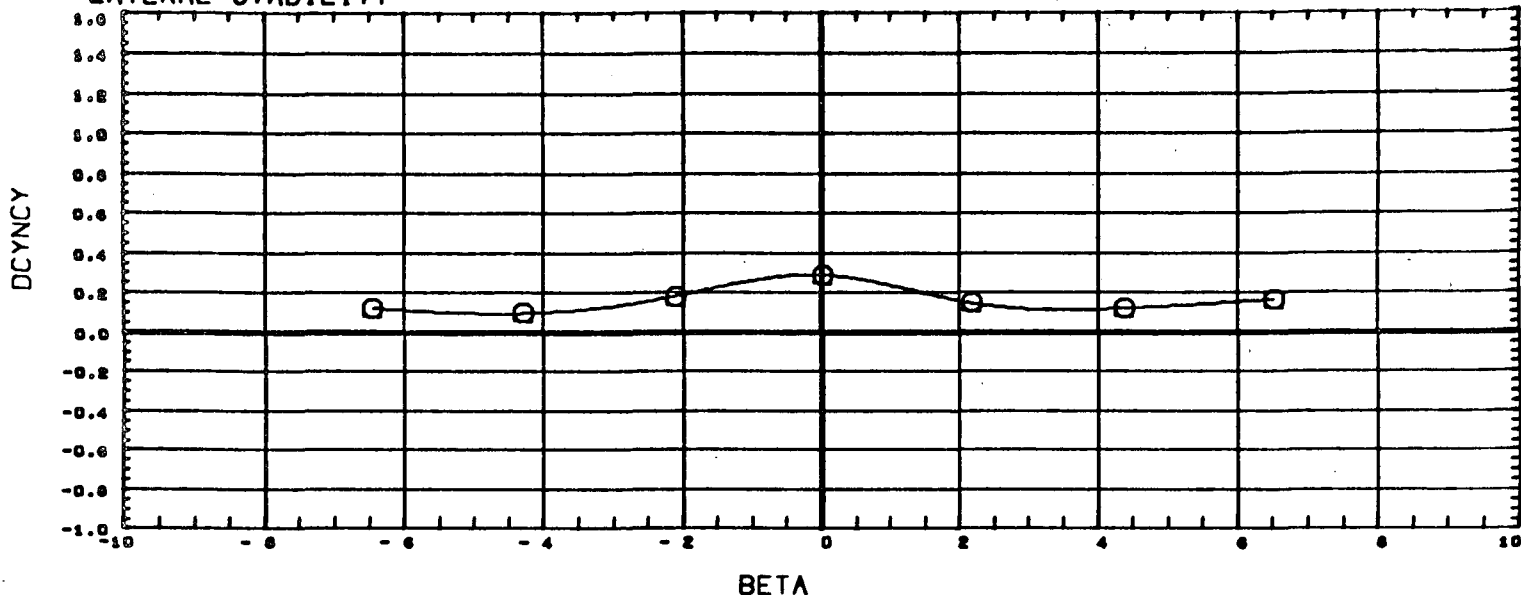
B5CW11AF2S1V7E2C3 (C5308L)

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LATERAL STABILITY



SYMBOL \square MACH 1.966
 PARAMETRIC VALUES
 ALPHA 25.000 RUDDER 0.000
 RUDDLR 30.000

REFERENCE INFORMATION
 SREF 14.6636 80. IN.
 LREF 4.9060 IN.
 BREF 5.6350 IN.
 XMRP 1.4021 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

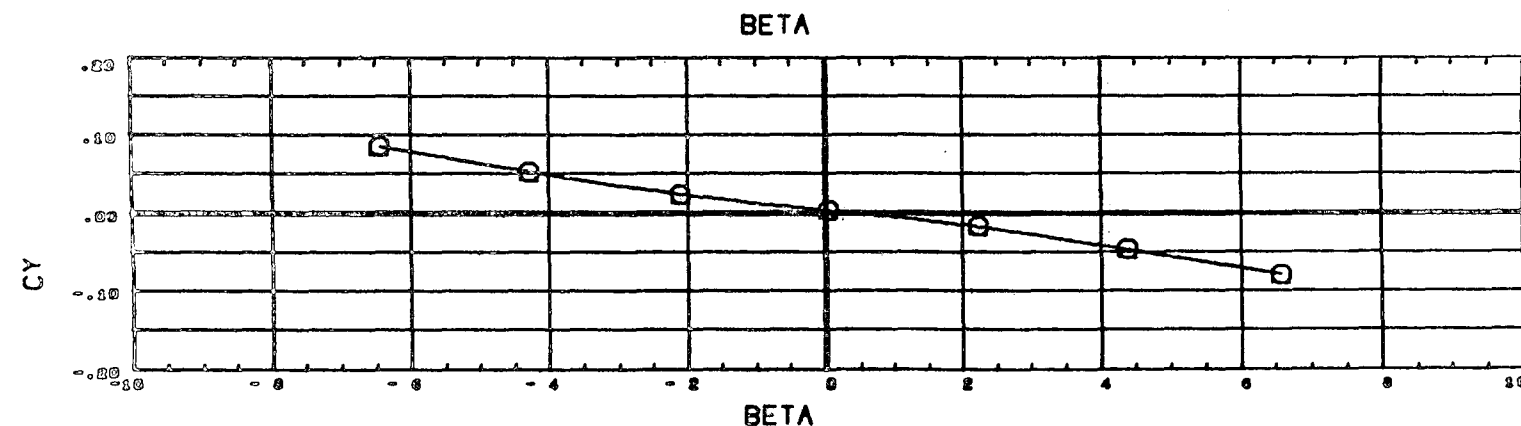
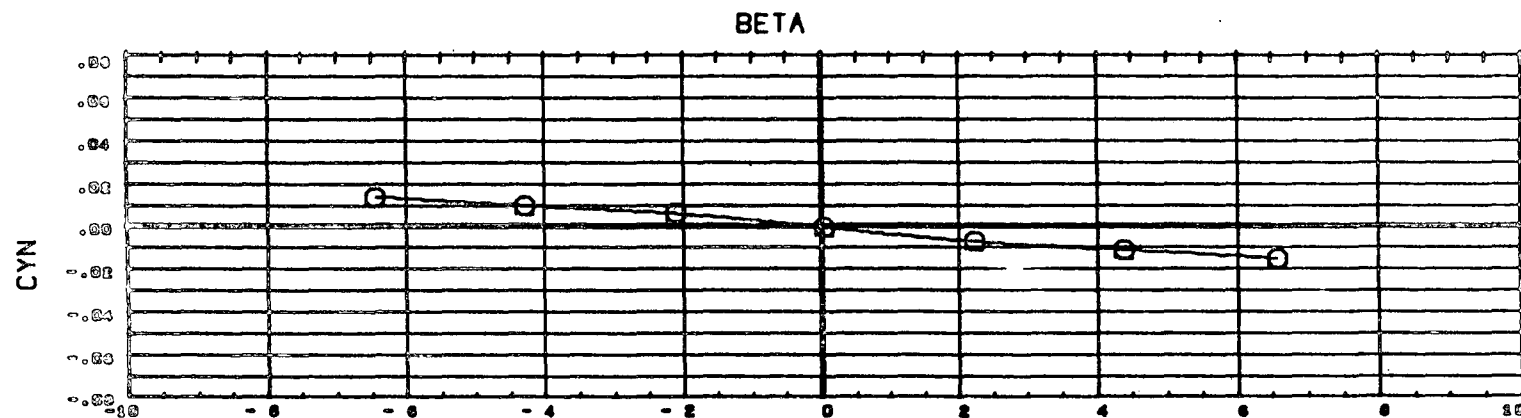
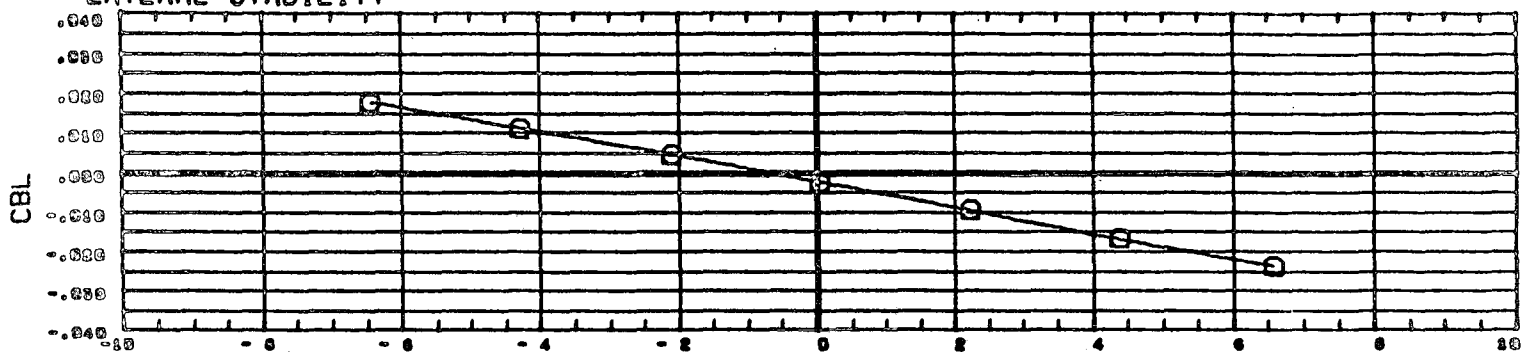
M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E2C3 (C5308L)

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LATERAL STABILITY



SYMBOL \bigcirc MACH 1.001
 PARAMETRIC VALUES
 ALPHA 25.000 RUDDER 0.000
 RUDFLR 20.000

REFERENCE INFORMATION
 SREF 14.6636 80. IN.
 LREF 4.9080 IN.
 SREF 5.6500 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

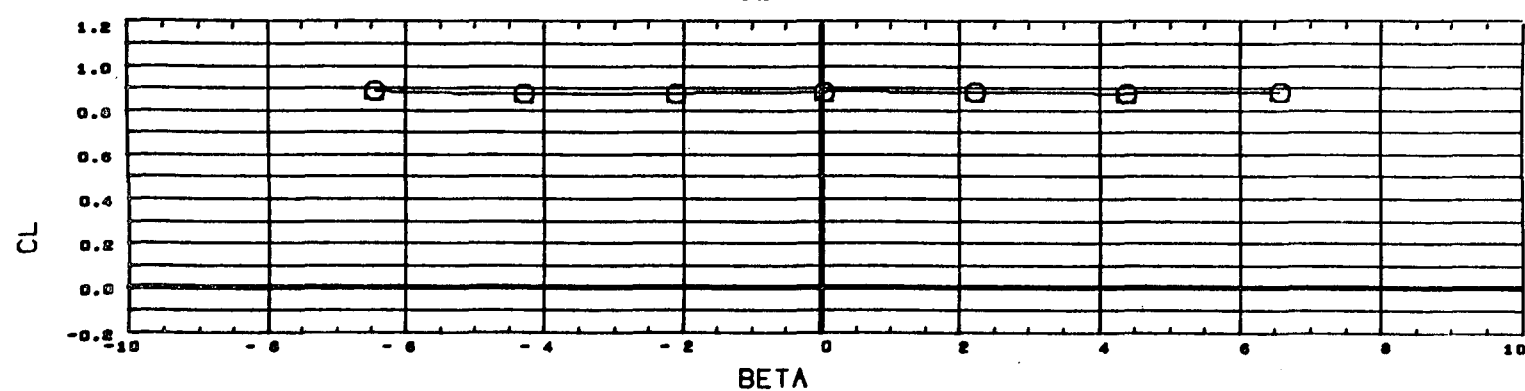
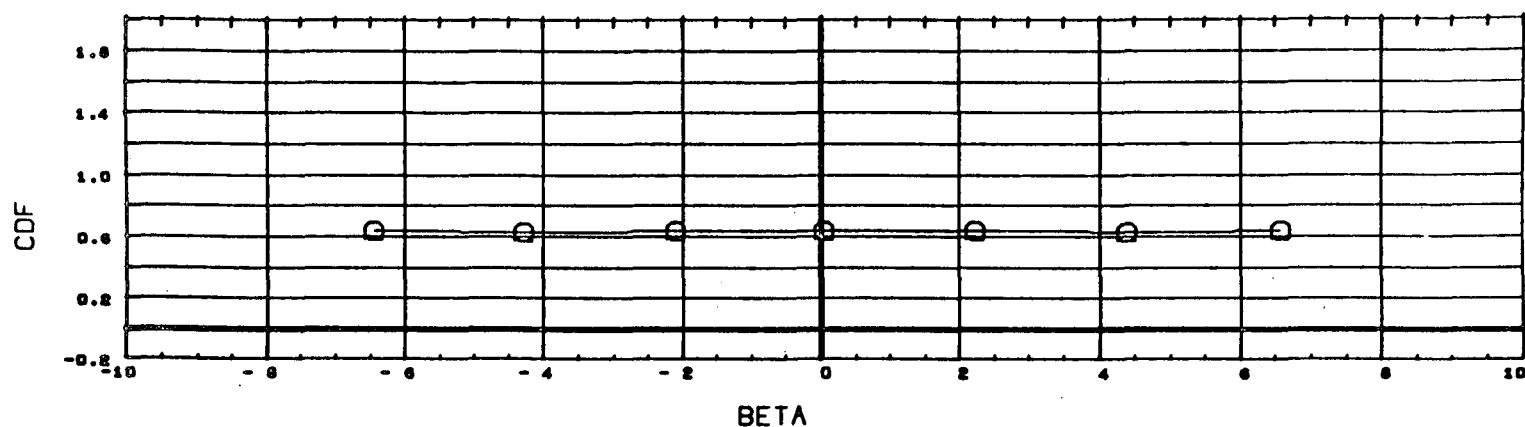
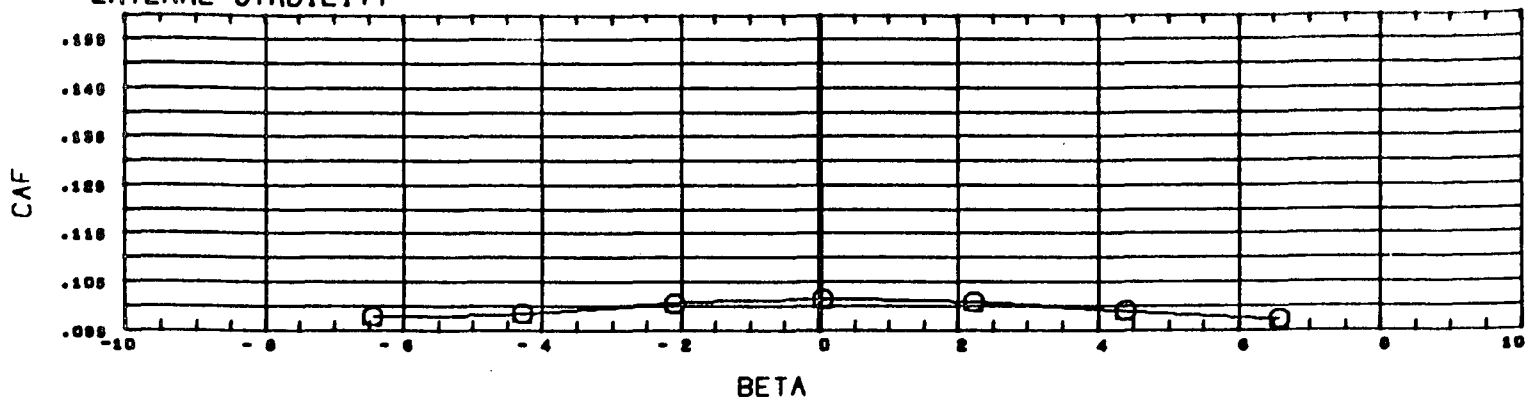
DATA HIST. CODE 6C

M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E2C4 (C5307L) 18 MAR 72

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LATERAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 O 1.981 ALPHA 25.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6036 30. IN.
 LREF 4.5060 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

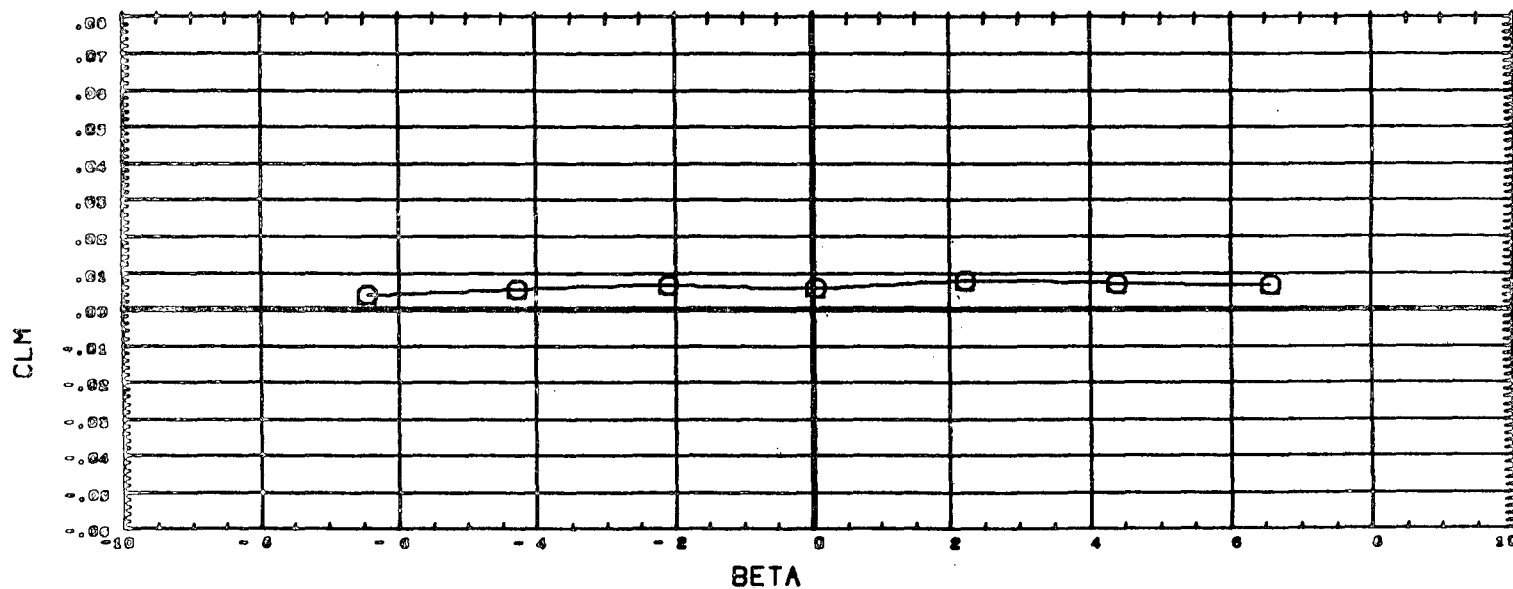
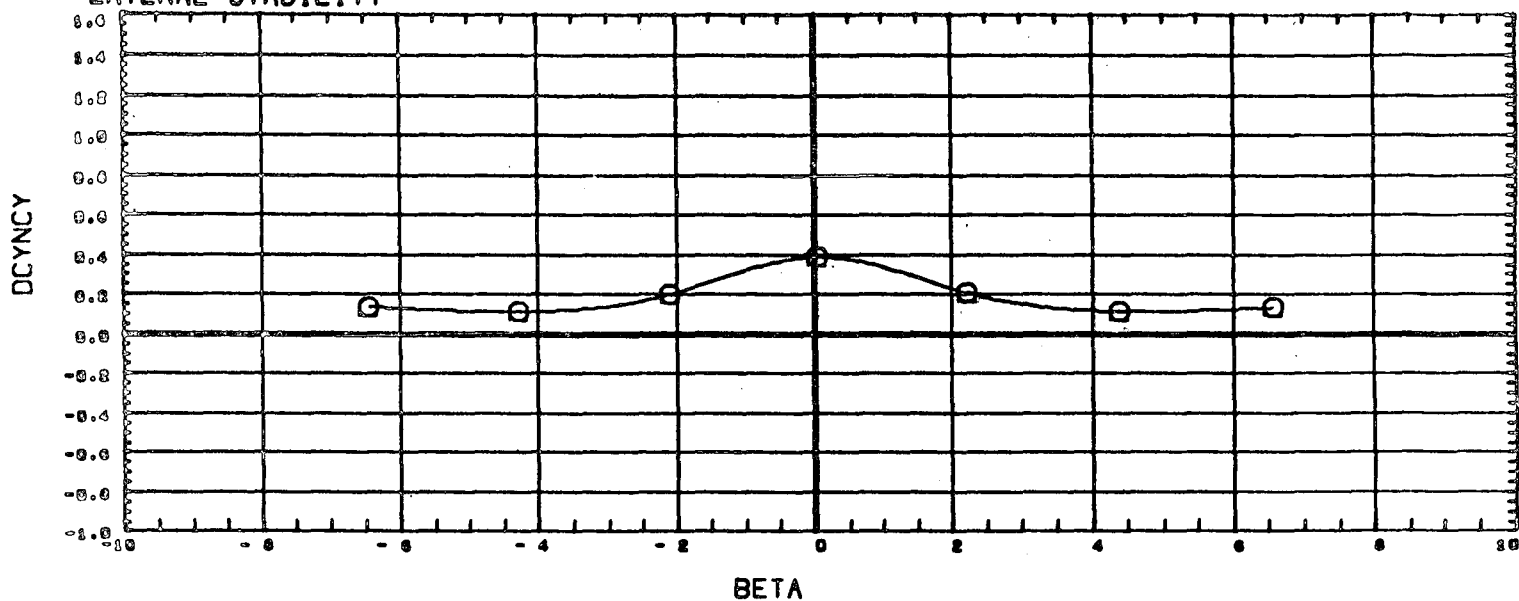
M513-MSFC MODELAR12161-2

B5CW11AF2S1V7E2C4 (C5307L)

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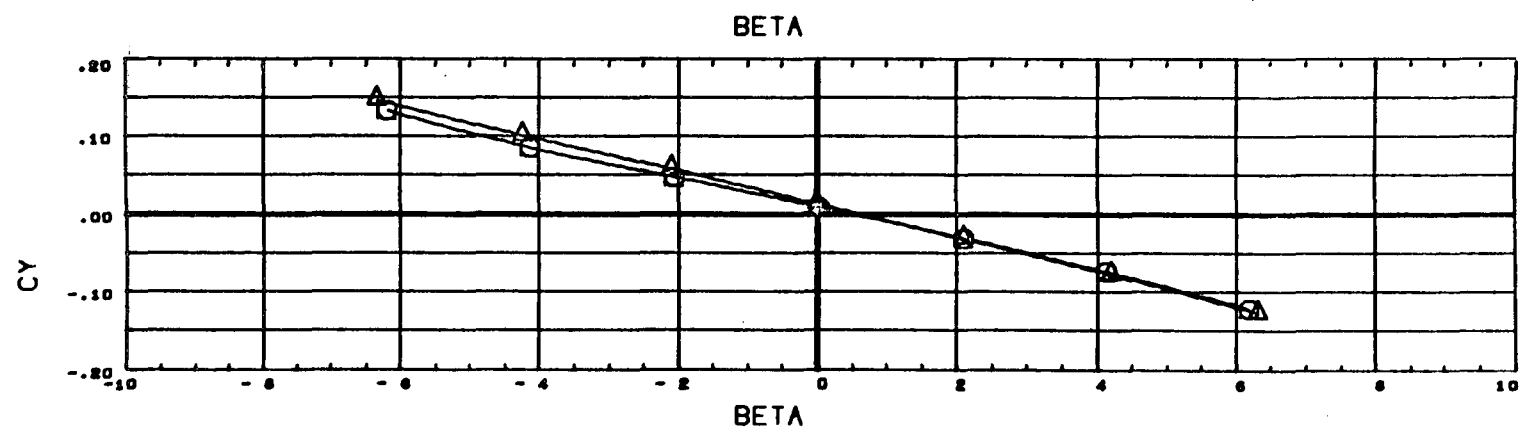
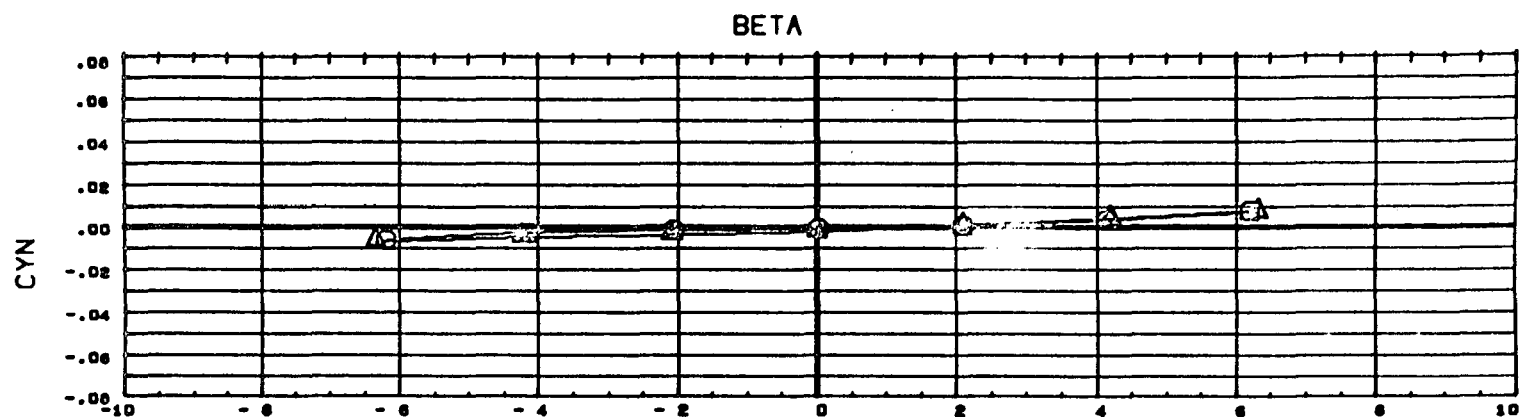
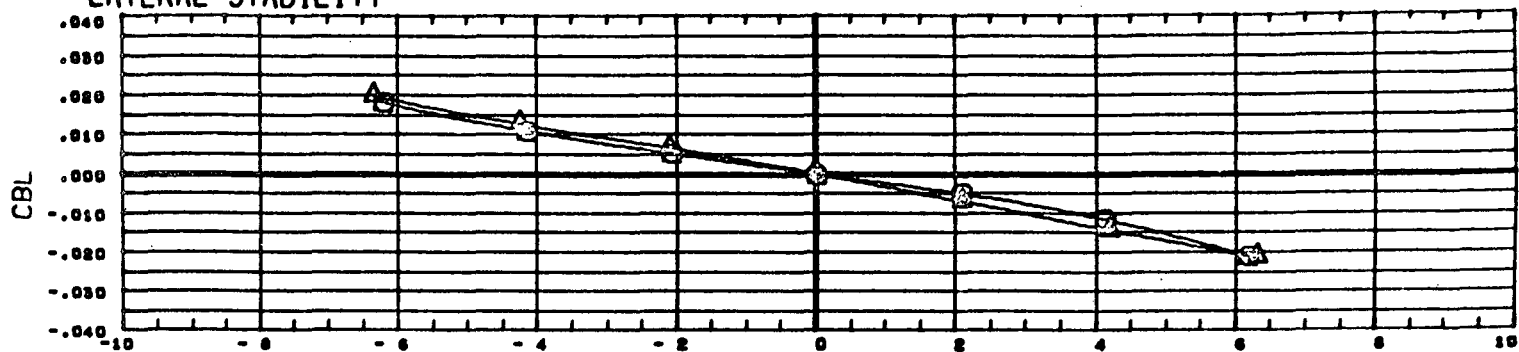


SYMBOL \bigcirc MACH 1.061 ALPHA 25.000 RUDDER 0.000
 RUDDLR 50.000

DATA HIST. CODE 6C

REFERENCE INFORMATION
 SREF 14.6936 89. IN.
 LREF 4.5060 IN.
 BREF 5.6550 IN.
 XNRP 1.4621 IN.
 YNRP 0.0000 IN.
 ZNRP 0.0000 IN.
 SCALE 0.0034

LATERAL STABILITY

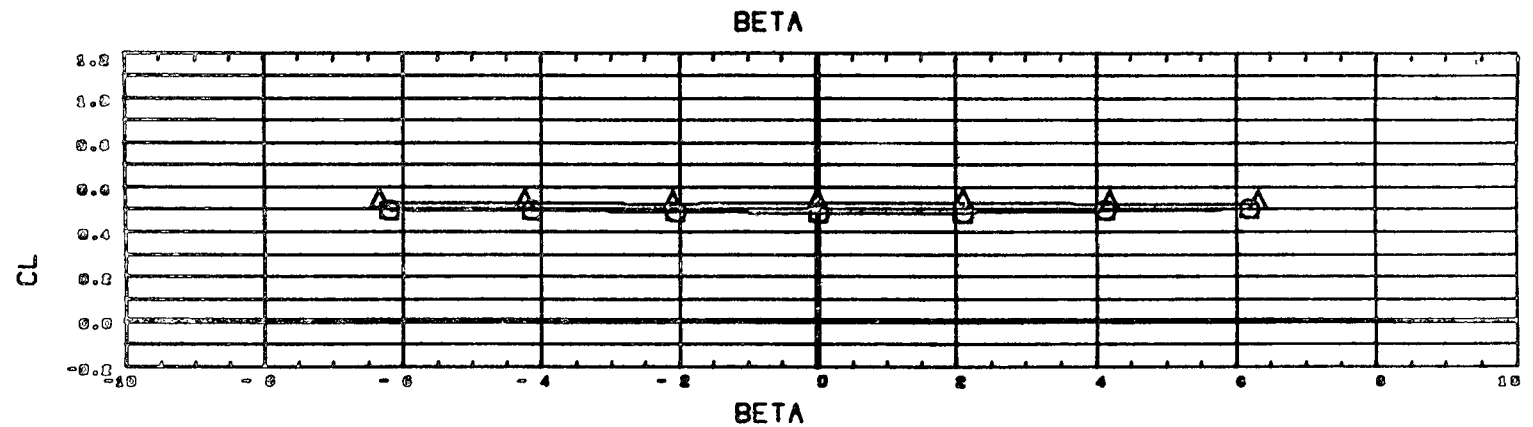
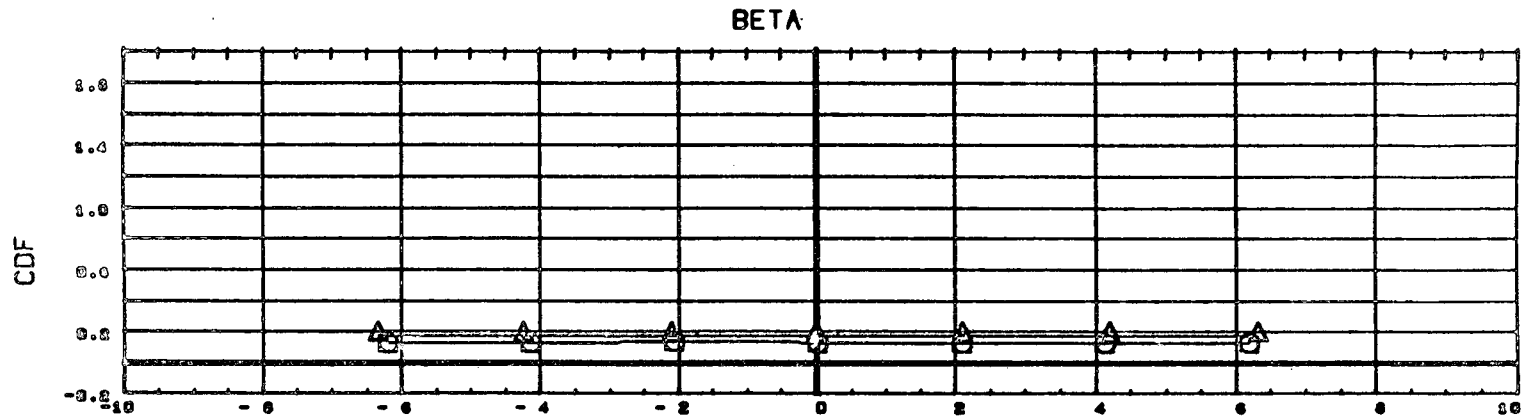
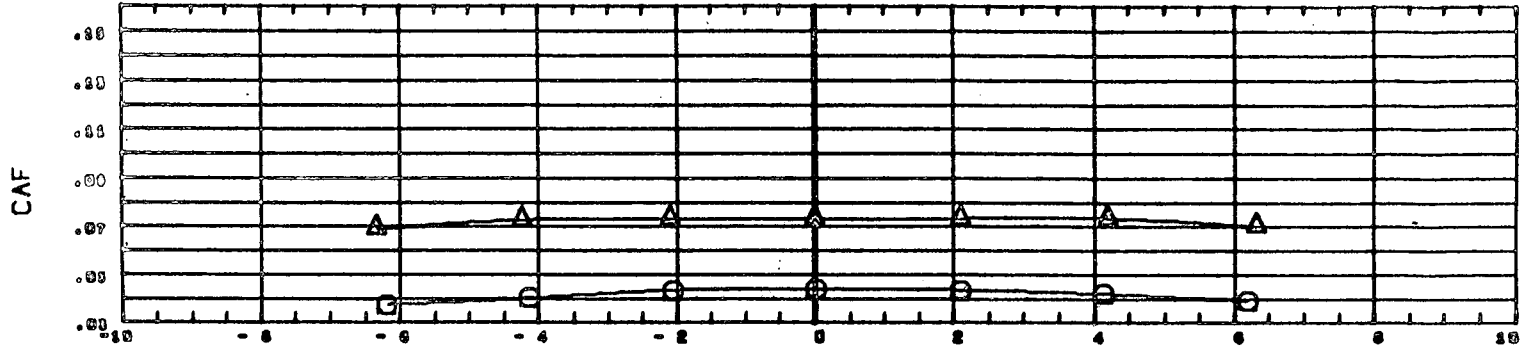


SYMBOL	MACH	PARAMETRIC VALUES		
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○	0.904	RUDFLR	30.000	

REFERENCE INFORMATION		
SREF	14.6836	89. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE 6C

LATERAL STABILITY



SYMBOL	WACH	PARAMETRIC VALUES
△	0.000	ALPHA 10.000 RUDDER 0.000
○	0.004	RUDFLR 30.000

REFERENCE INFORMATION		
SREF	14.6036	89. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA MIST. CODE GC

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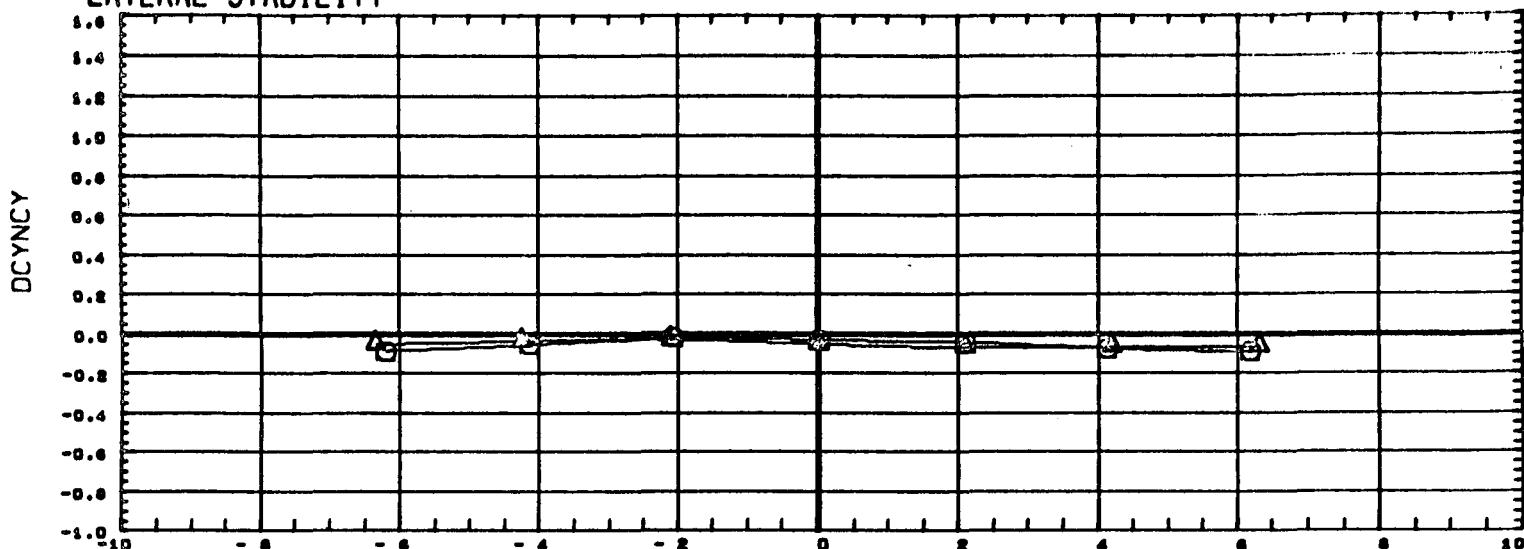
(C5318G)

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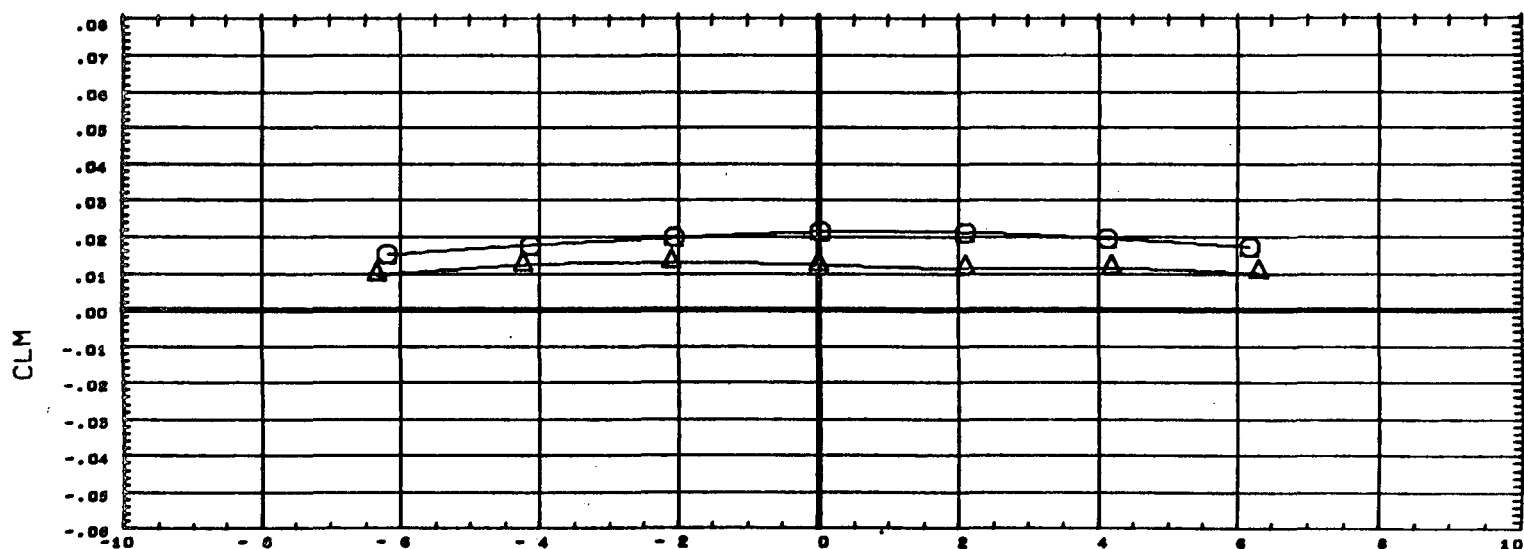
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LATERAL STABILITY



BETA



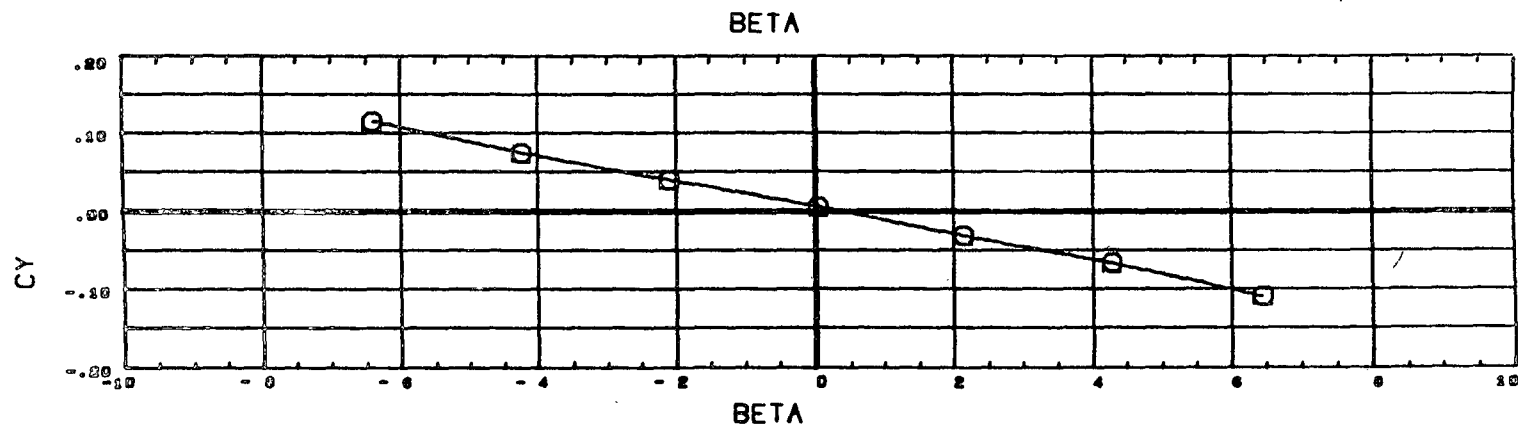
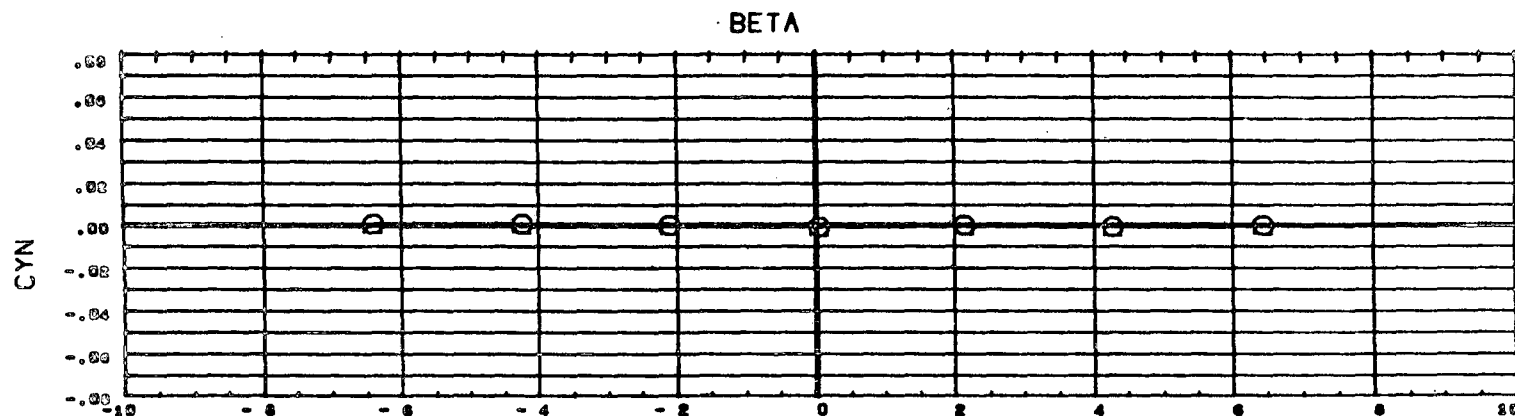
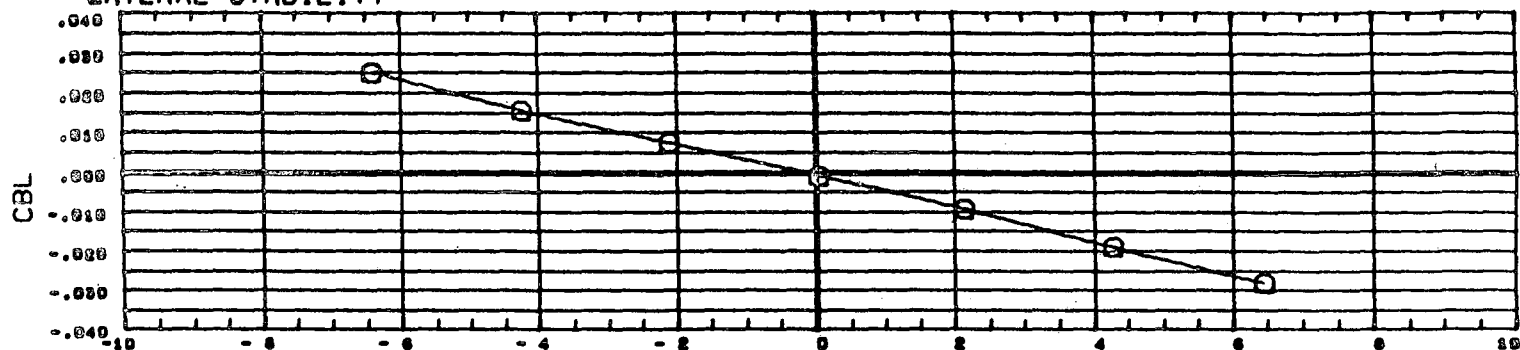
BETA

SYMBOL	MACH	PARAMETRIC VALUES	RUDDER	0.000
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△	0.904	RUDFLR	30.000	

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SREF	14.8836	90. IN.
LREF	4.5080	IN.
BREF	5.6590	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE CC

LATERAL STABILITY

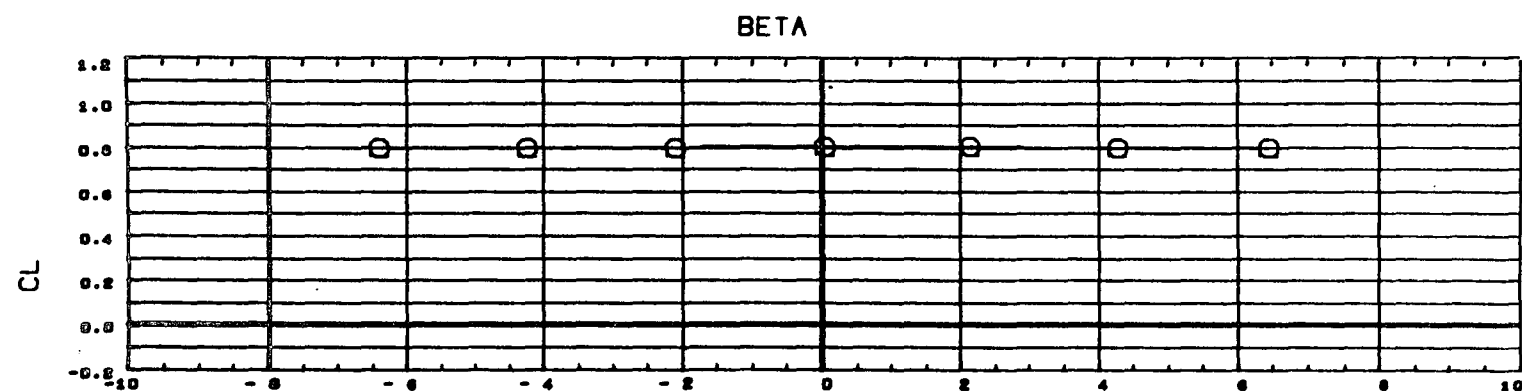
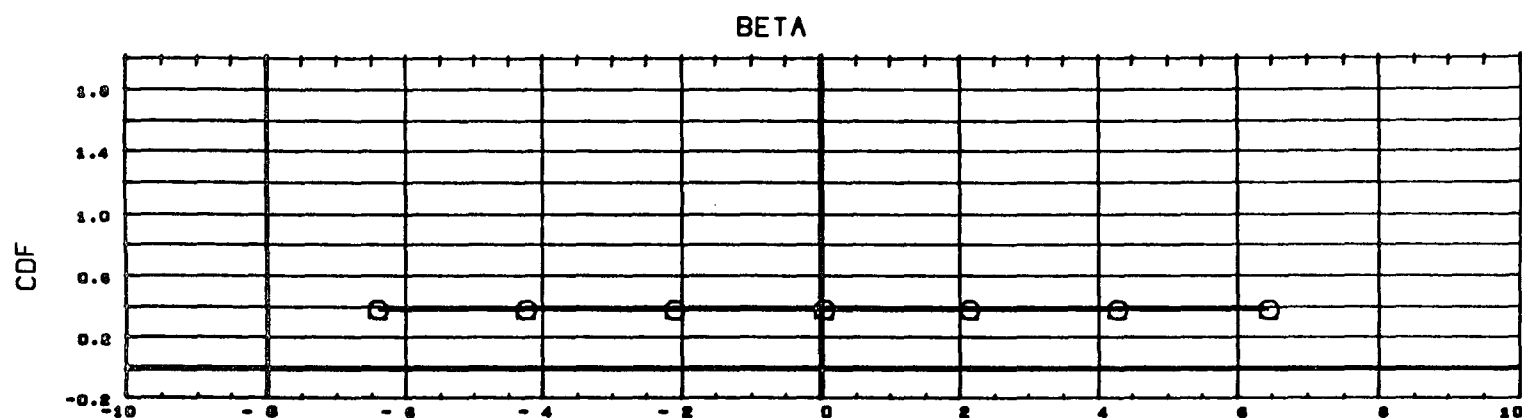
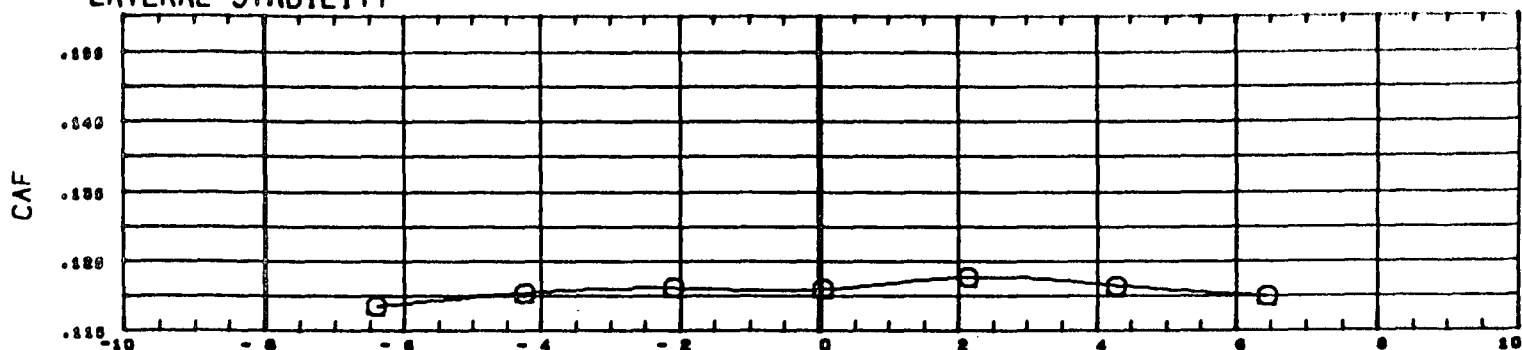


SYMBOL MACH PARAMETRIC VALUES
 O 1.197 ALPHA 15.000 RUDDER 0.000
 RUDDLR 30.000

REFERENCE INFORMATION
 SREF 14.6636 30. IN.
 LREF 4.5060 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA MIST. CODE 6C

LATERAL STABILITY

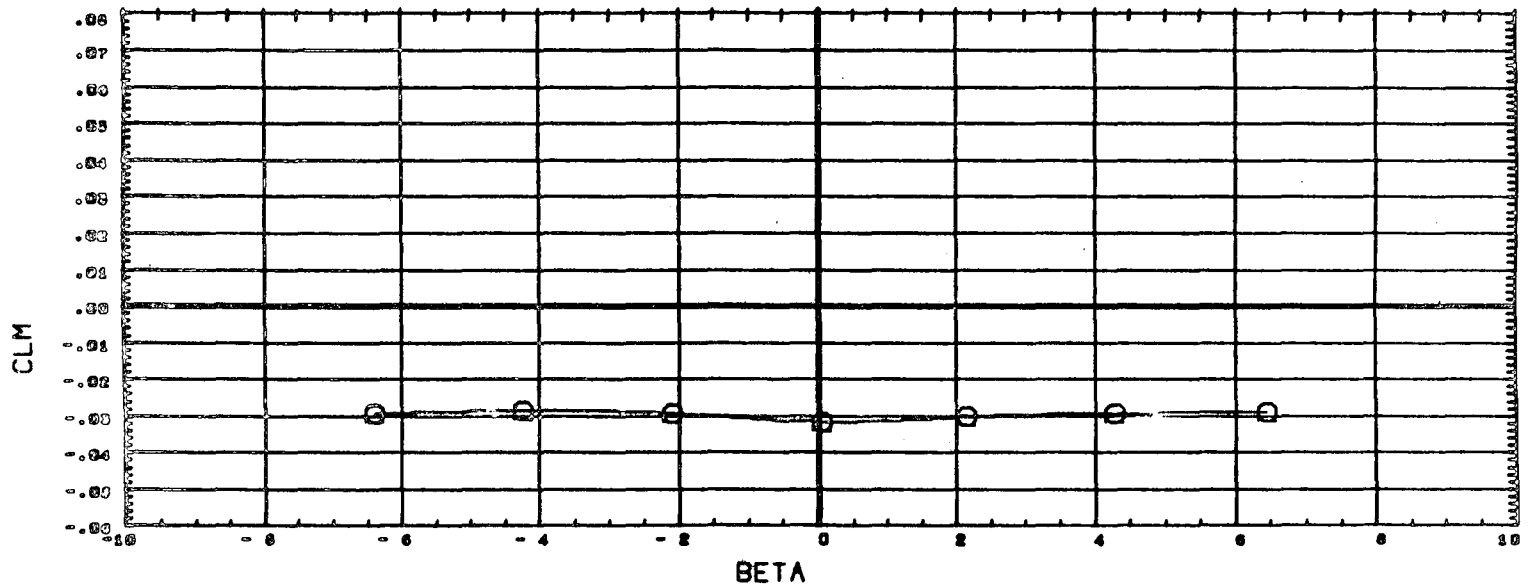
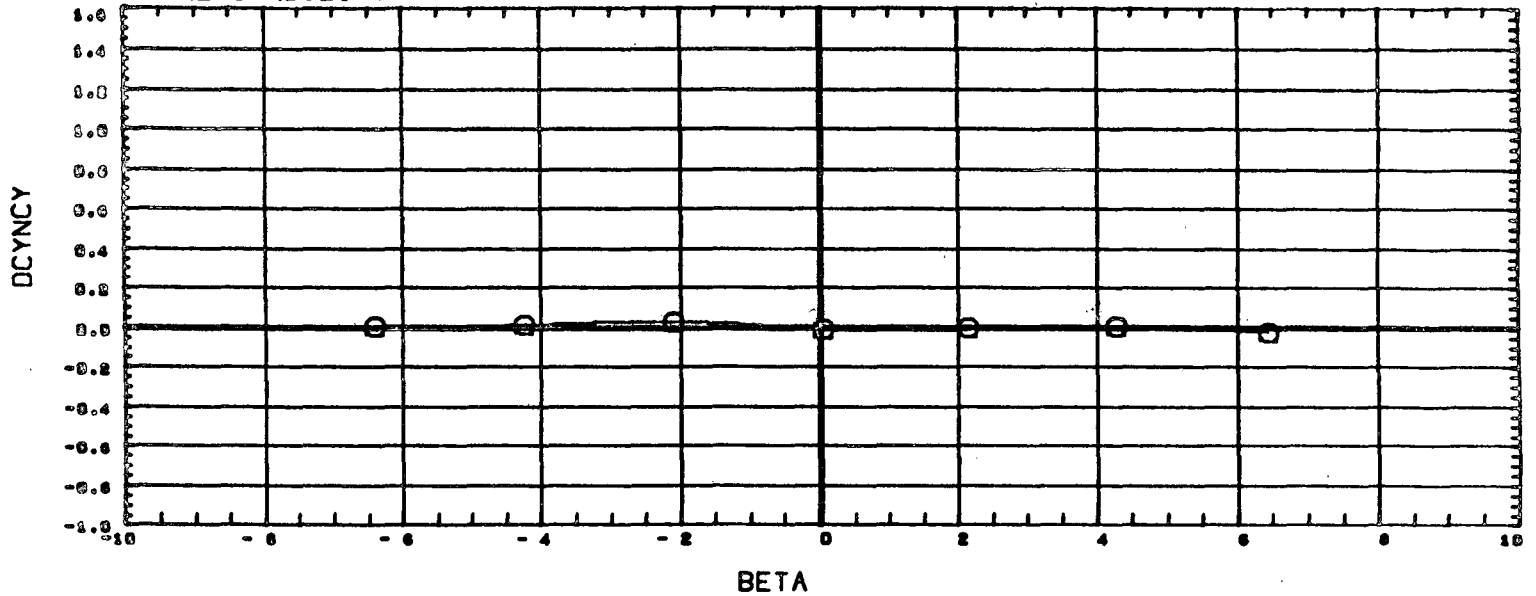


SYMBOL MACH PARAMETRIC VALUES
 O 1.107 ALPHA 15.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6036 80. IN.
 LREF 4.5080 IN.
 SREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

LATERAL STABILITY

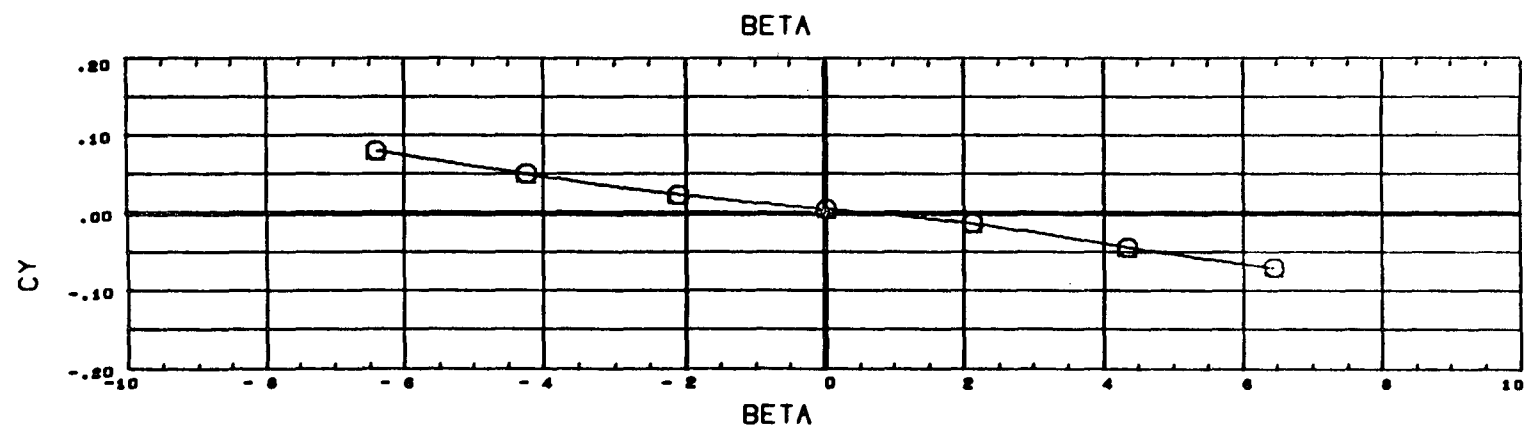
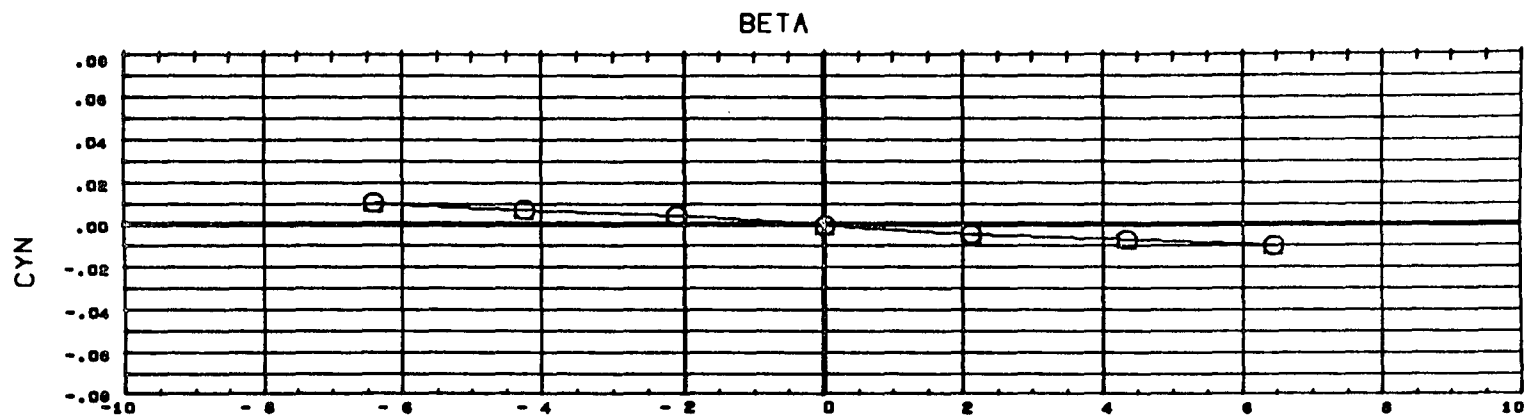
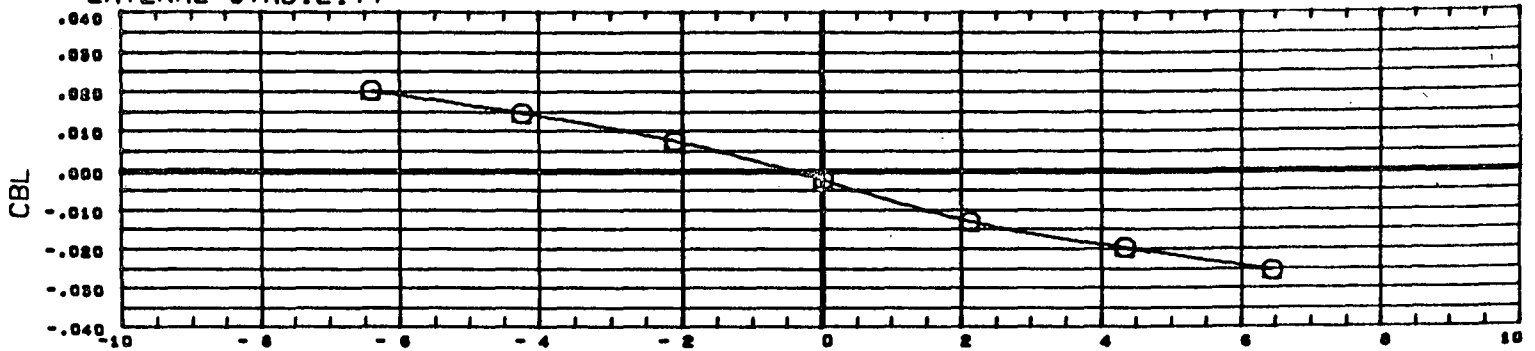


SYMBOL O MACH 8.197
 PARAMETRIC VALUES
 ALPHA 15.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.3080 IN.
 BREF 5.0550 IN.
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 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

LATERAL STABILITY

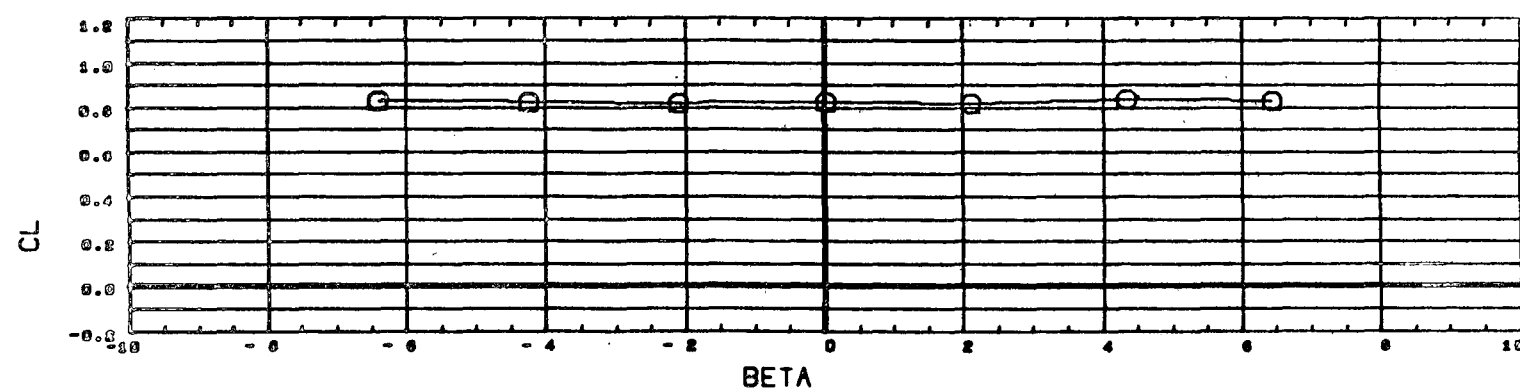
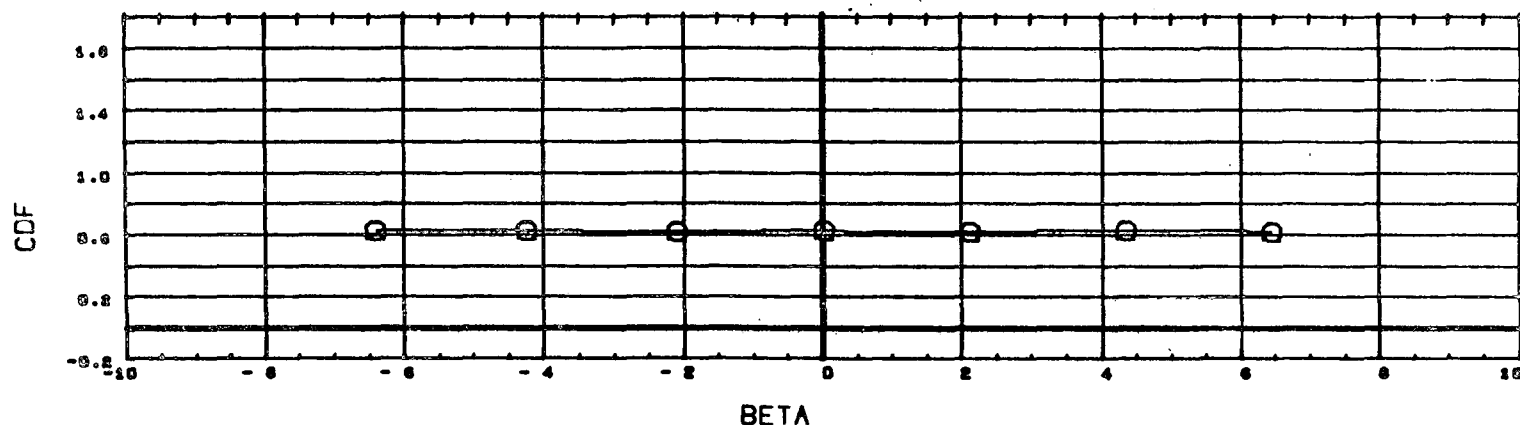
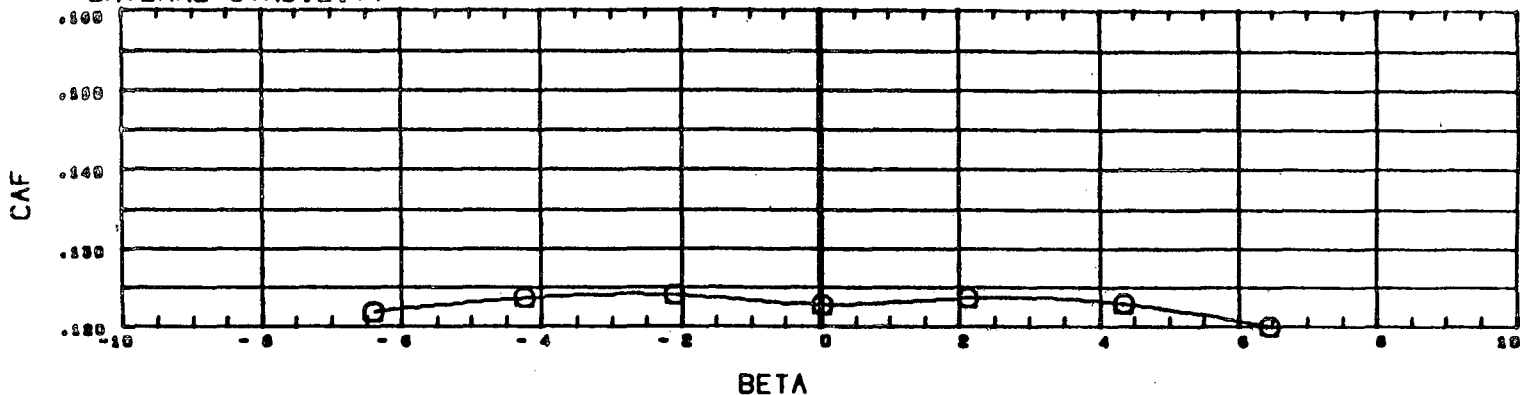


SYMBOL \bigcirc MACH 1.971 ALPHA 25.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 SQ. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

LATERAL STABILITY



SYMBOL \bigcirc MACH 1.071 ALPHA 29.000 RUDDER 0.000
 RUDDLR 30.000

REFERENCE INFORMATION
 SREF 14.6036 80. IN.
 LREF 4.5060 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE . GC

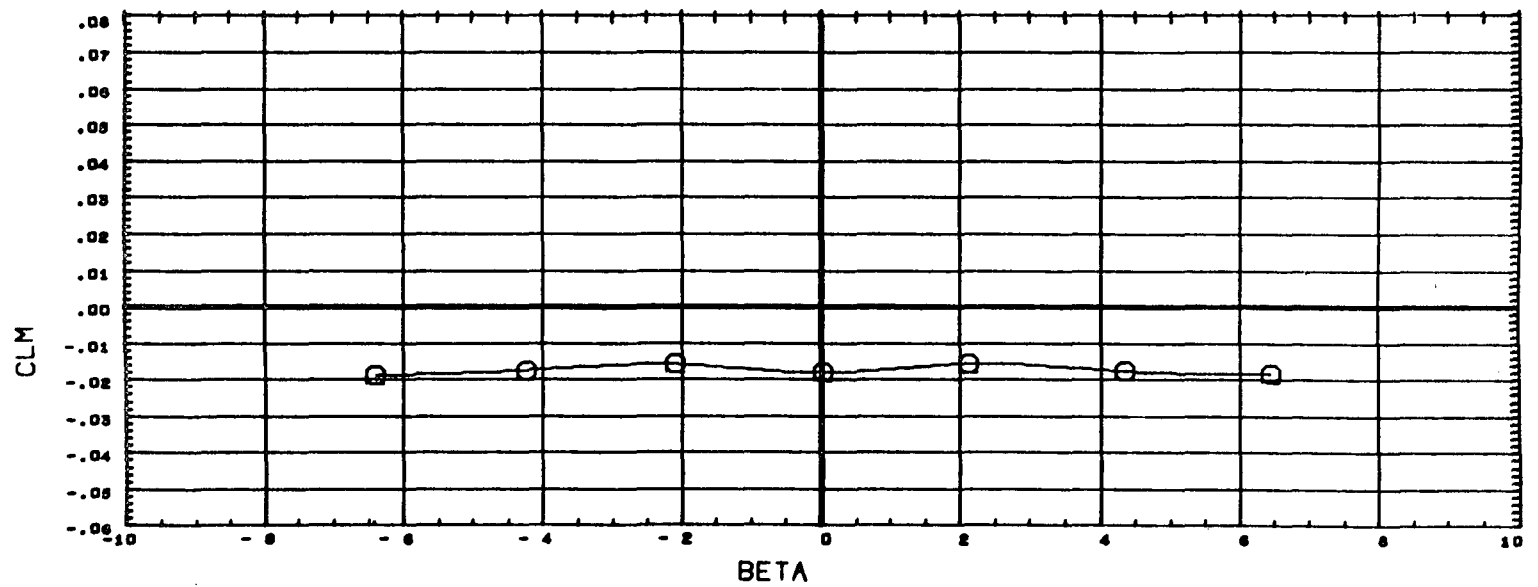
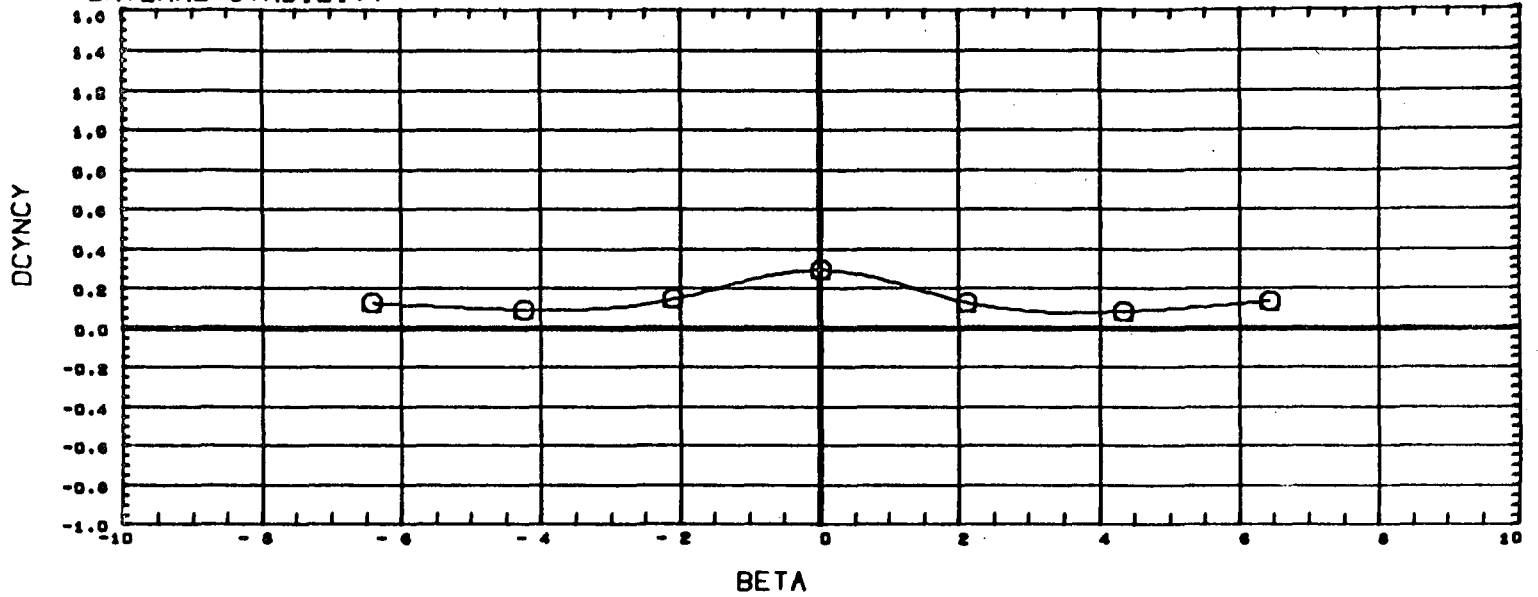
M513-MSFC MODELAR1216I-2

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LATERAL STABILITY

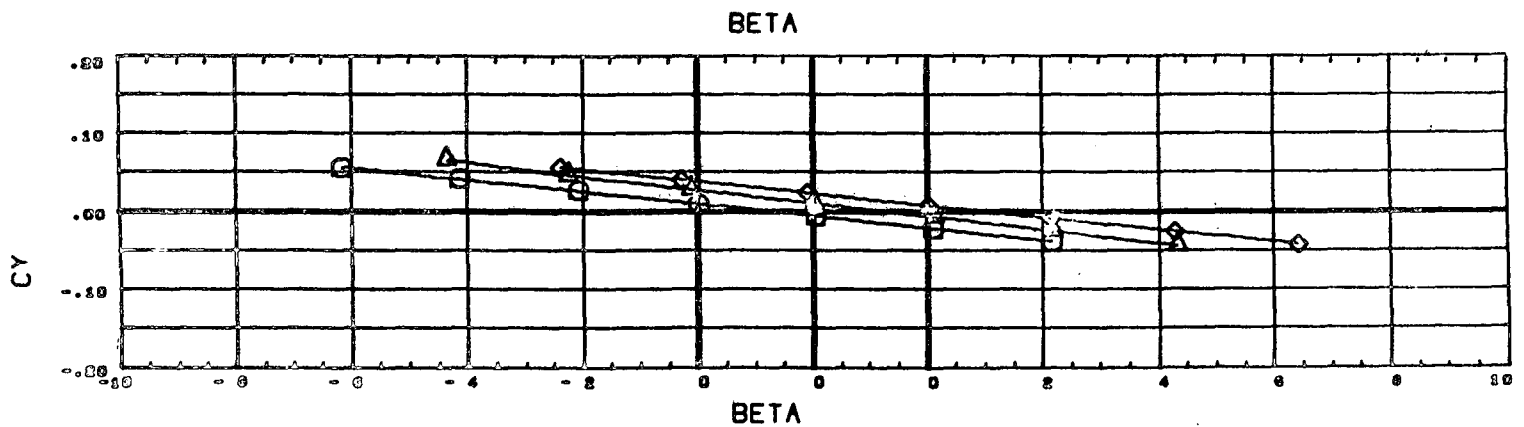
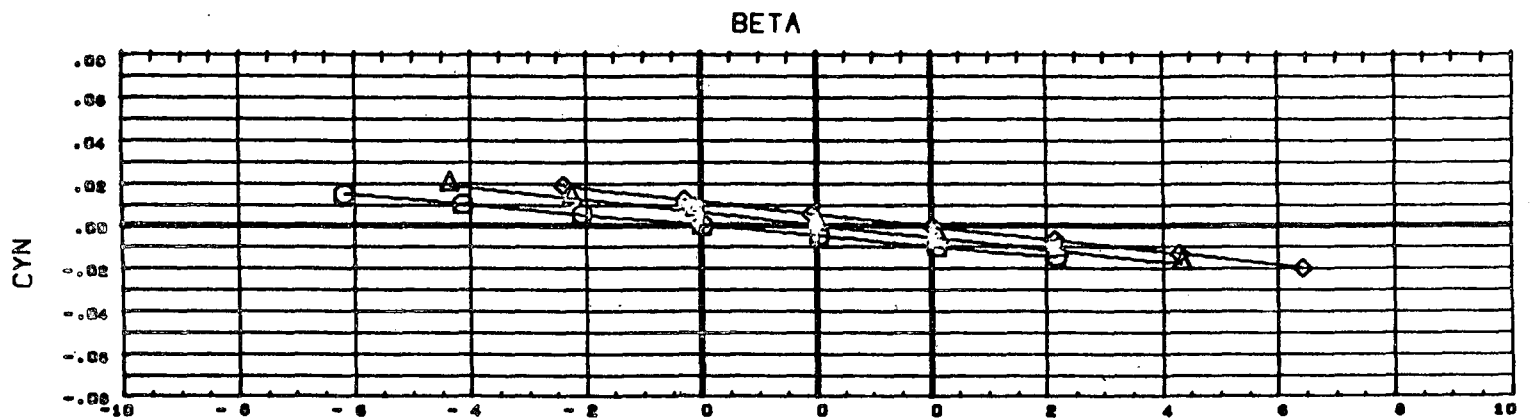
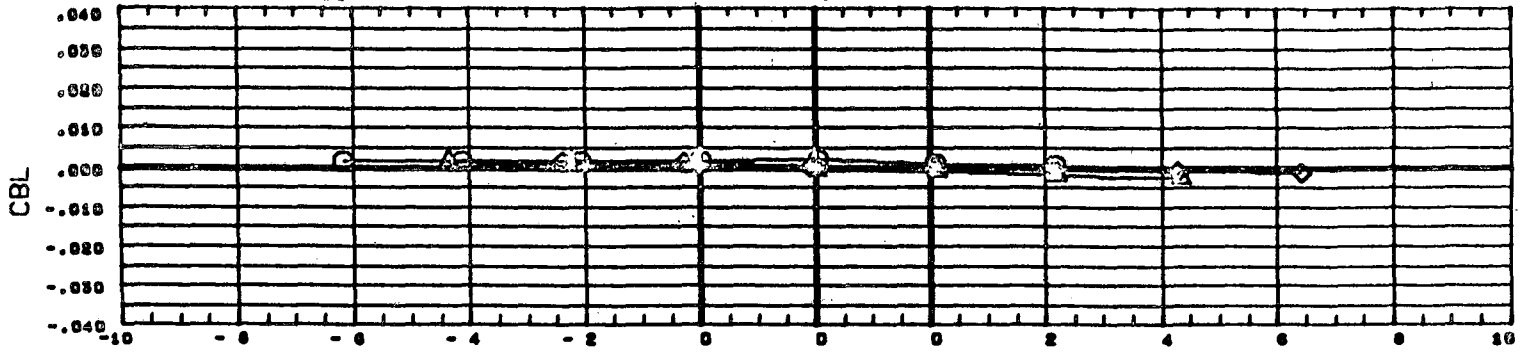


SYMBOL \square MACH 1.971
 ALPHA 25.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6636 SQ. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

LATERAL STABILITY

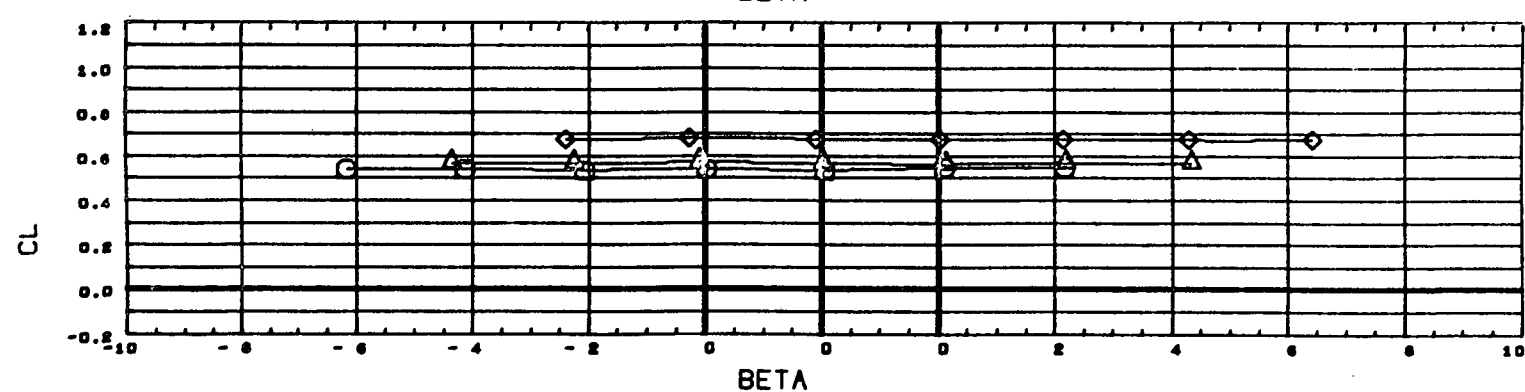
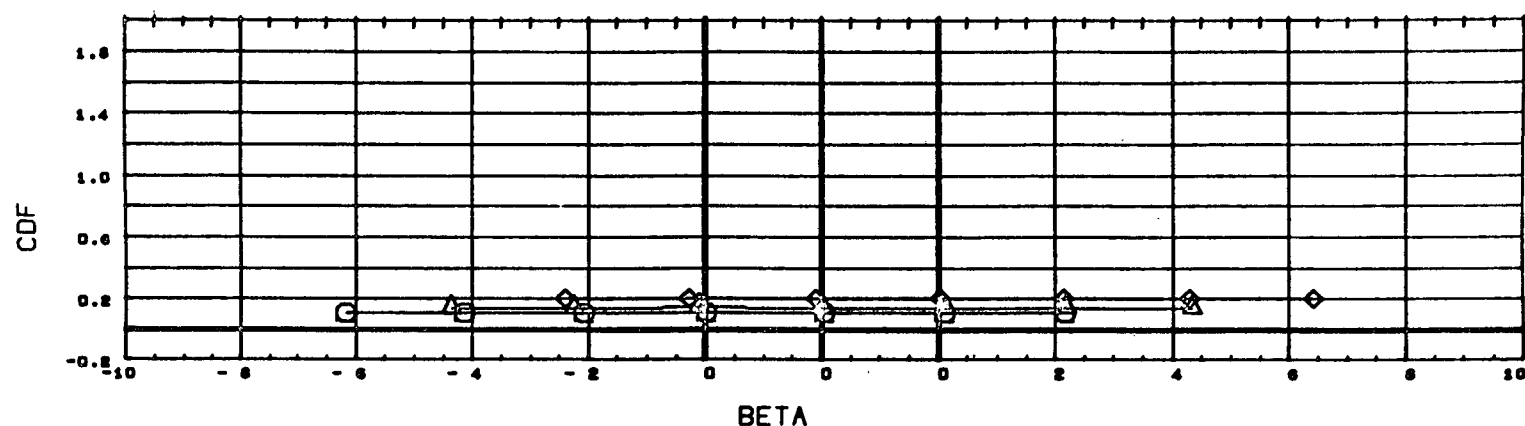
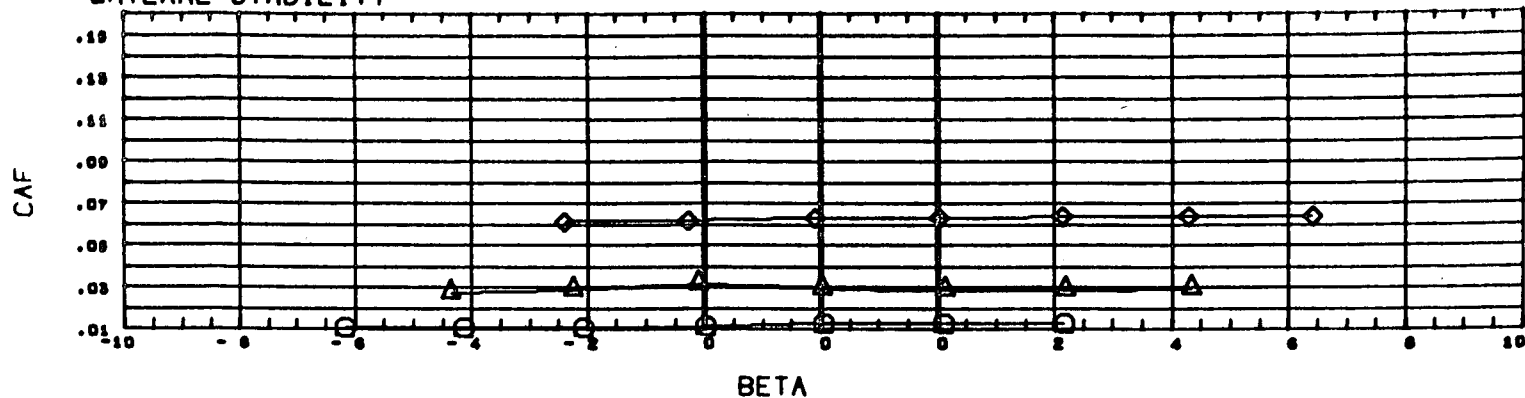


SYMBOL	WACH	ALPHA	PARAMETRIC VALUES
○	0.557	10.000	
△	0.900		
◇	1.300		

DATA MEET. CODE 6C

REFERENCE INFORMATION		
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LREF	4.5000	IN.
BREF	9.6550	IN.
XNRP	1.4021	IN.
YNRP	0.0000	IN.
ZNRP	0.0000	IN.
SCALE	0.0034	

LATERAL STABILITY

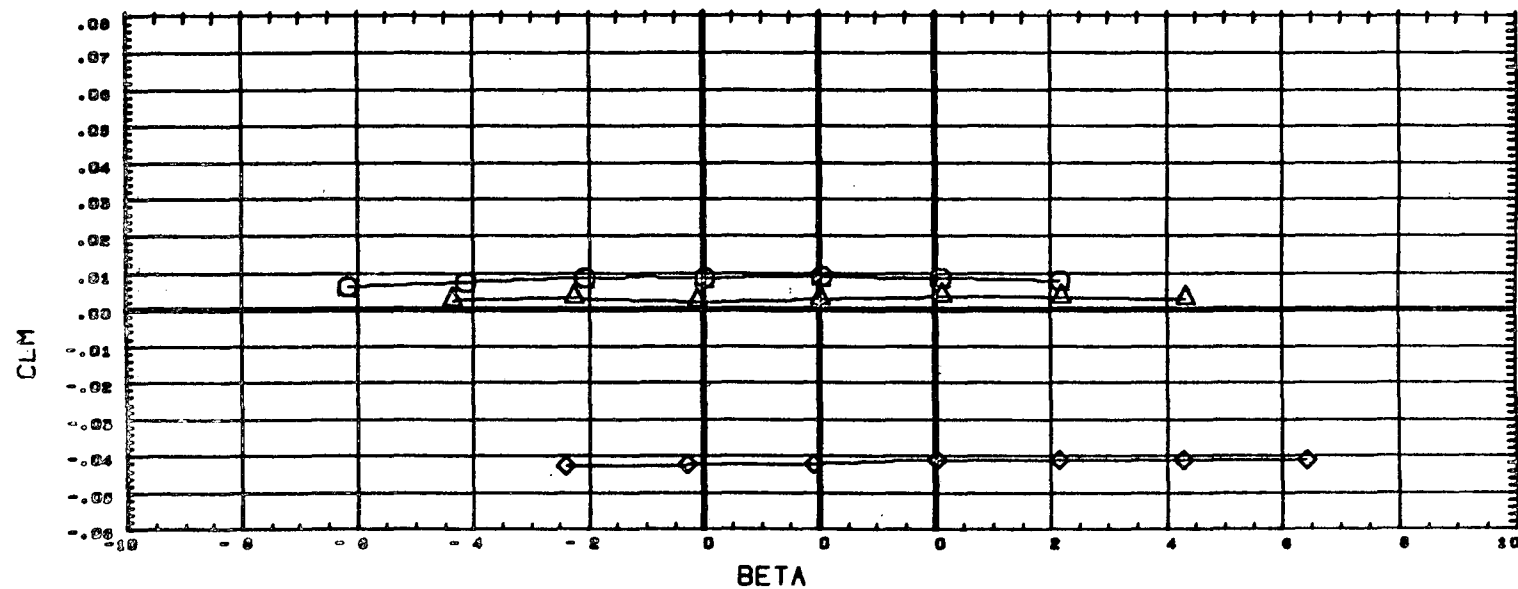
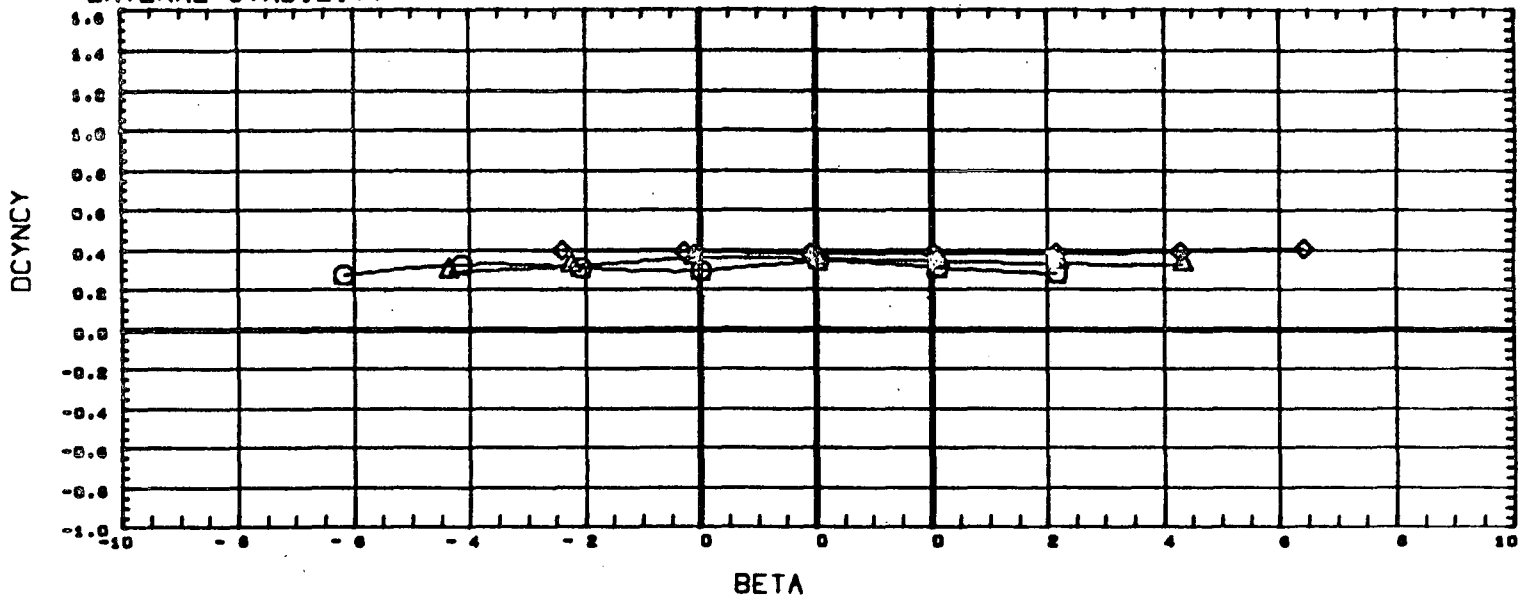


SYMBOL MACH PARAMETRIC VALUES
 ○ 0.597 ALPHA 10.000
 △ 0.005
 ◇ 1.196

REFERENCE INFORMATION
 SREF 14.6036 80. IN.
 LREF 4.5080 IN.
 SREF 5.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

LATERAL STABILITY

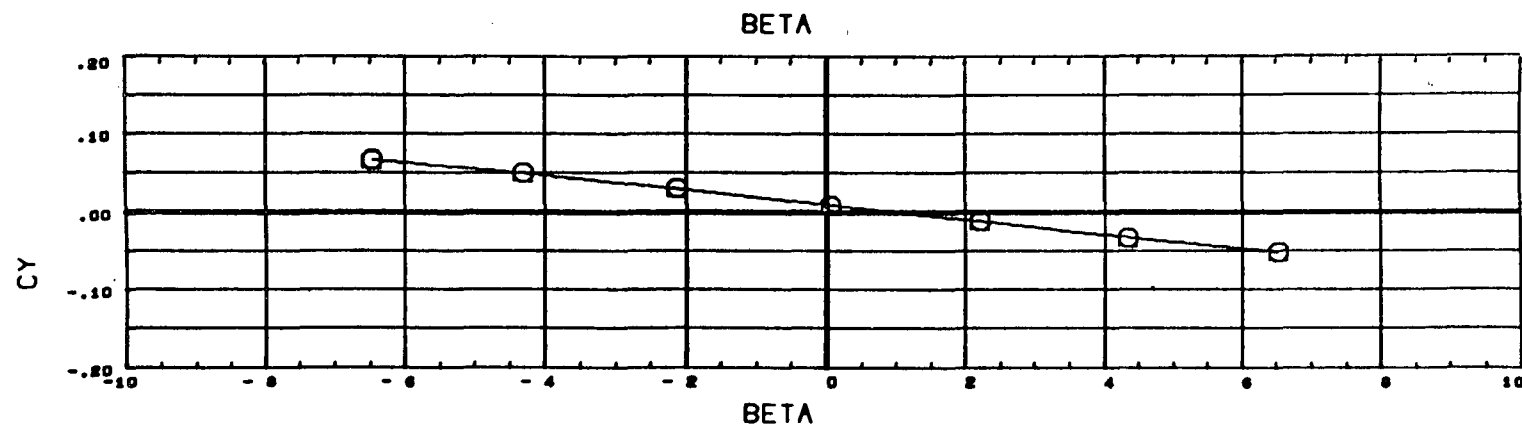
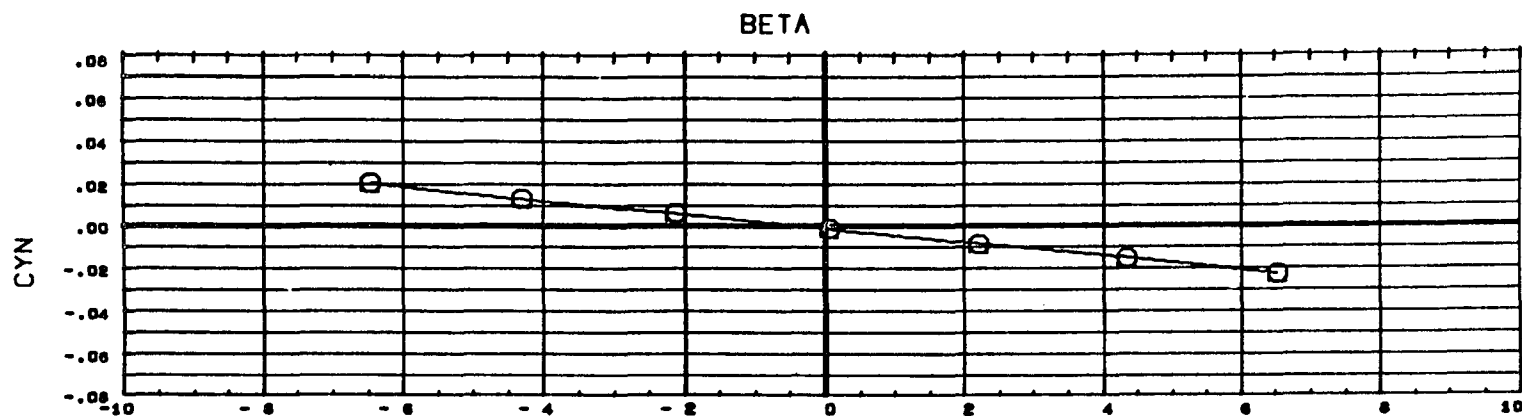
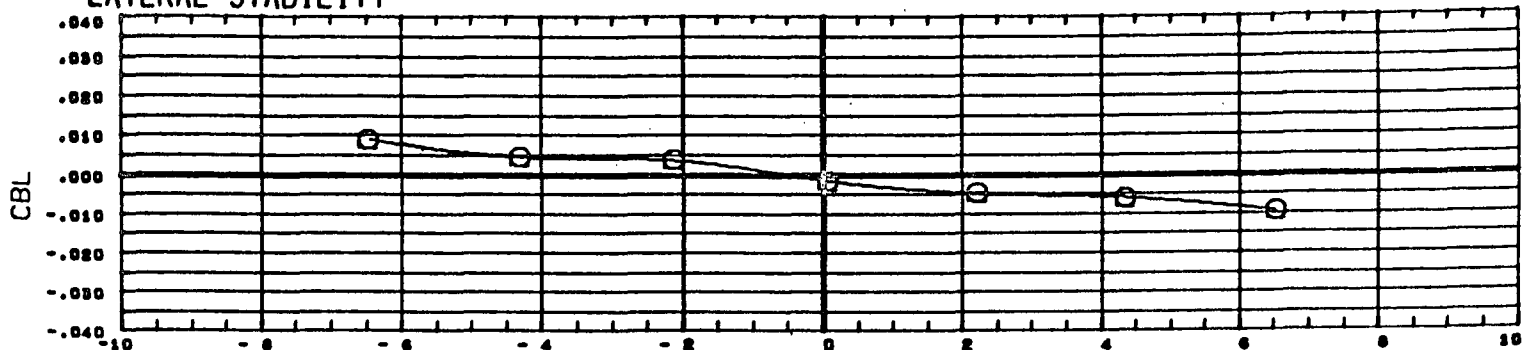


SYMBOL	MACH	ALPHA	PARAMETRIC VALUES
○	0.897		10.000
△	0.908		
◇	1.196		

REFERENCE INFORMATION		
BREF	14.6836	88. IN.
LREF	4.5080	IN.
BREF	5.6350	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

LATERAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 O 1.199 ALPHA 15.000

REFERENCE INFORMATION
 SREF 14.6836 SQ. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

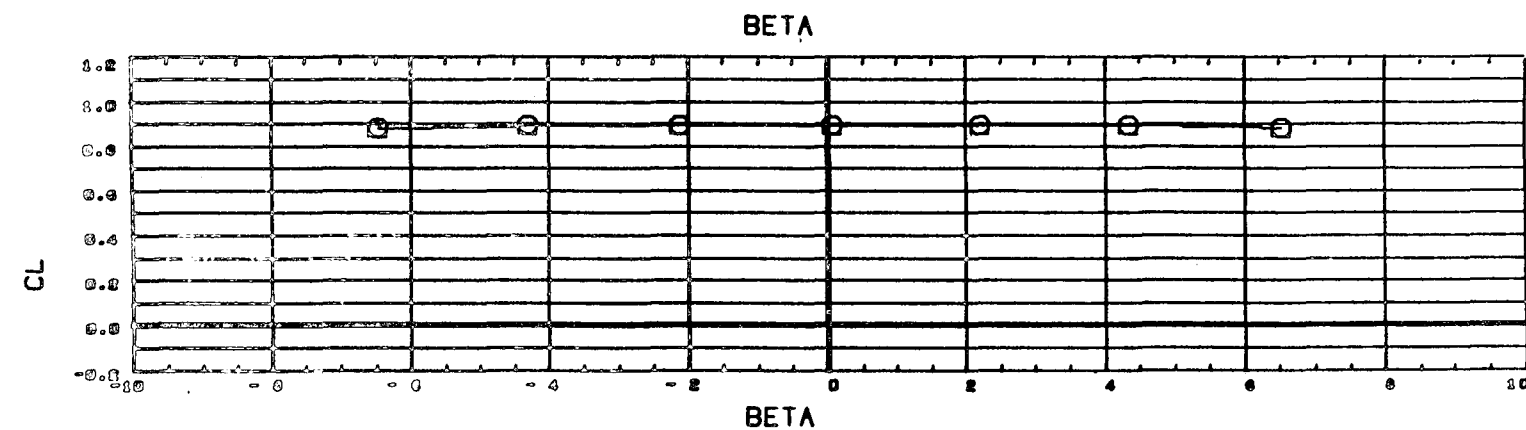
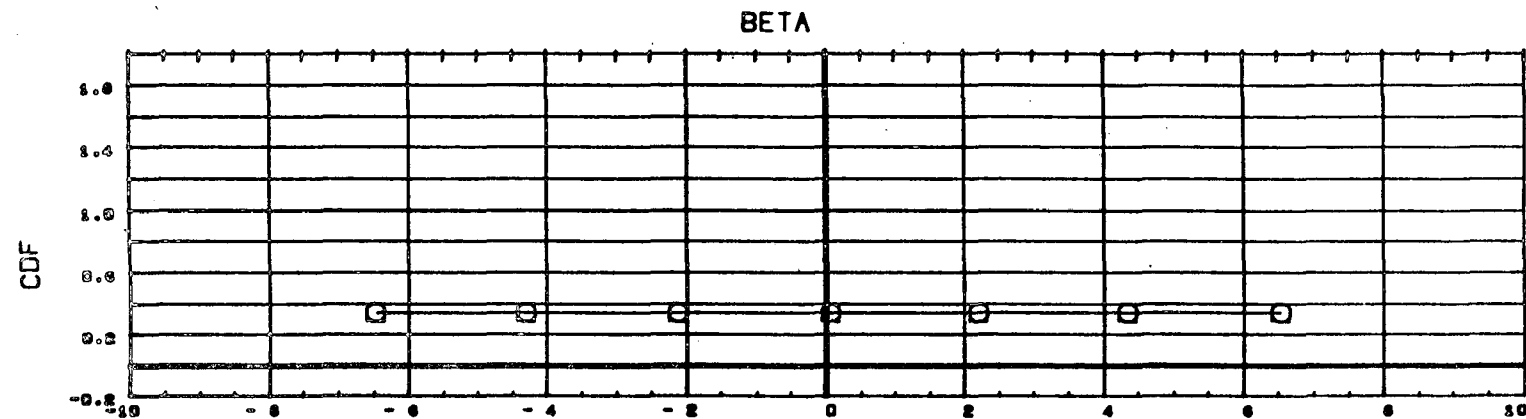
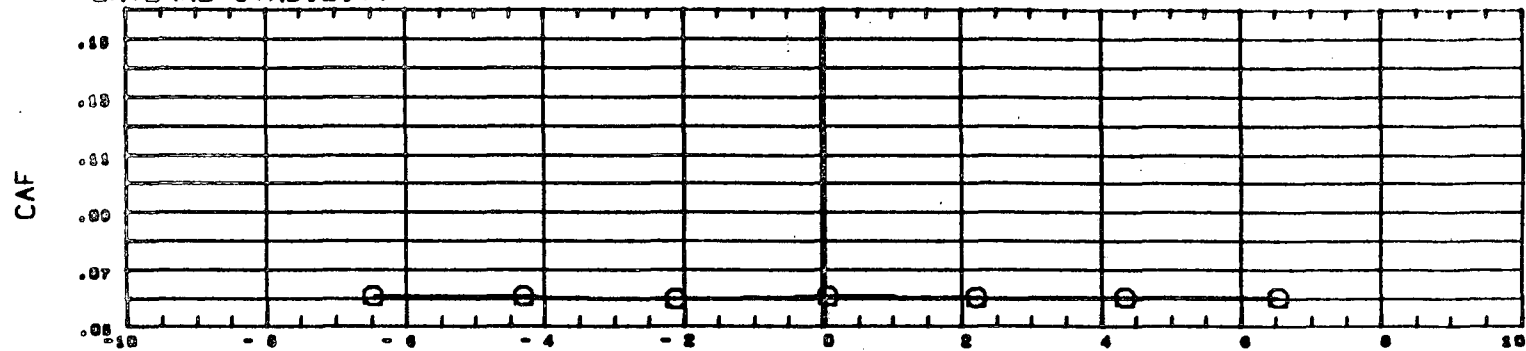
M513-MSFC MODELAR12161-2

B5CW11AF2S1

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LATERAL STABILITY



SYMBOL MACN PARAMETRIC VALUES
 O 1.200 ALPHA 15.000

REFERENCE INFORMATION
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 LREF 4.5000 IN.
 BREF 5.6590 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA MIST. CODE 6C

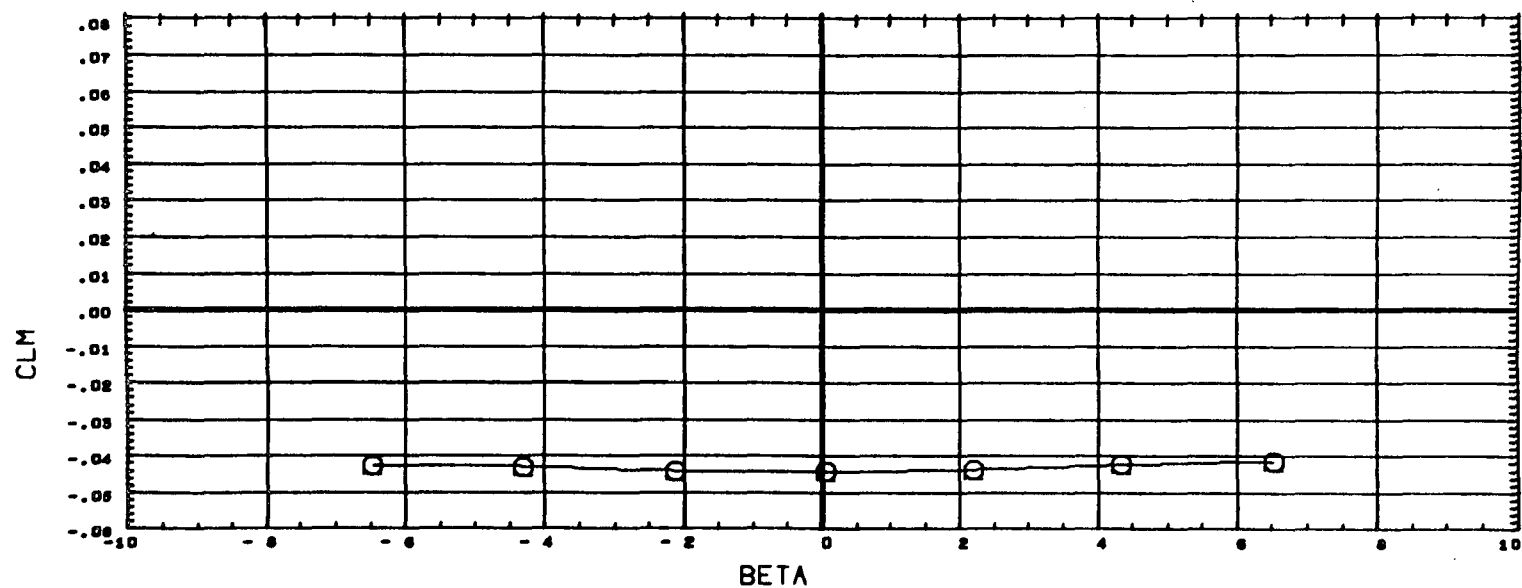
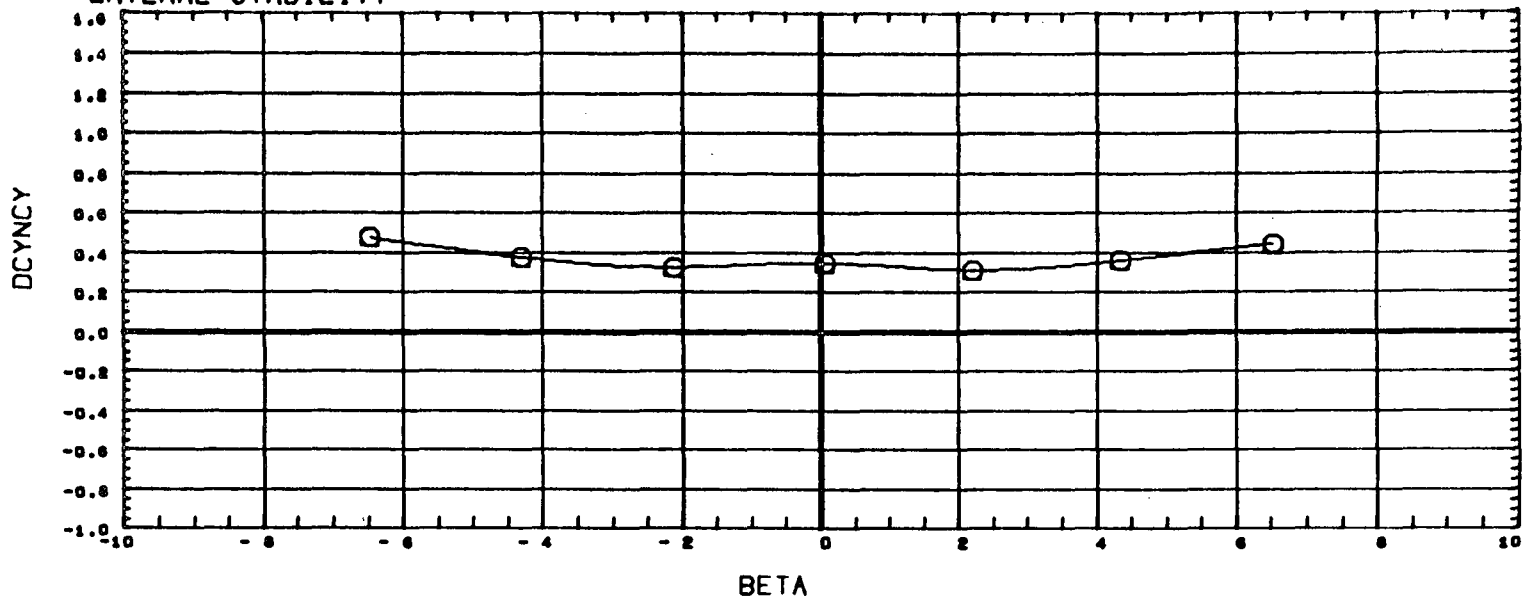
M513-MSFC MODELAR1216I-2

B5CW11AF2S1

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LATERAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 O 2.199 ALPHA 19.000

REFERENCE INFORMATION
 SREF 14.6636 88. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

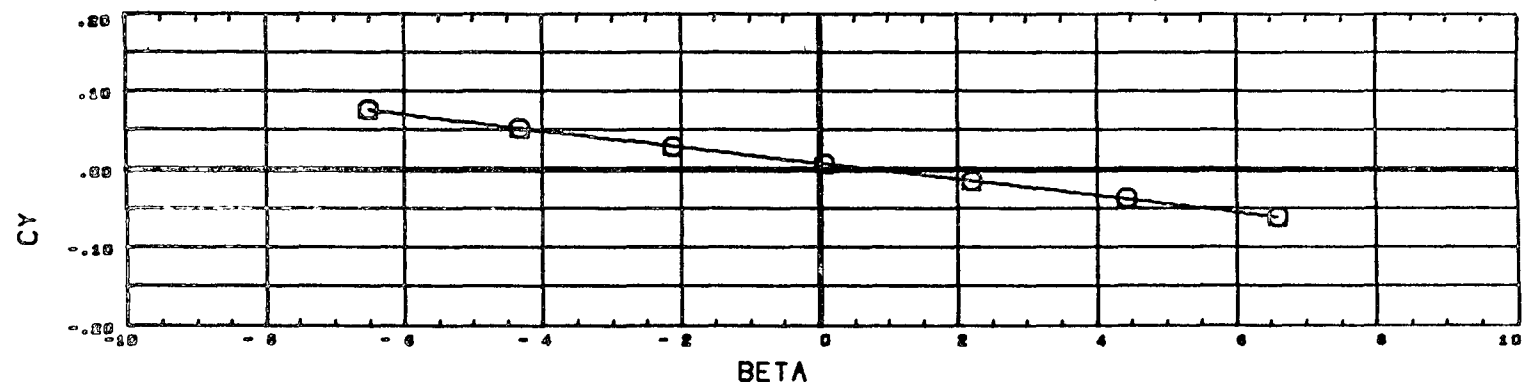
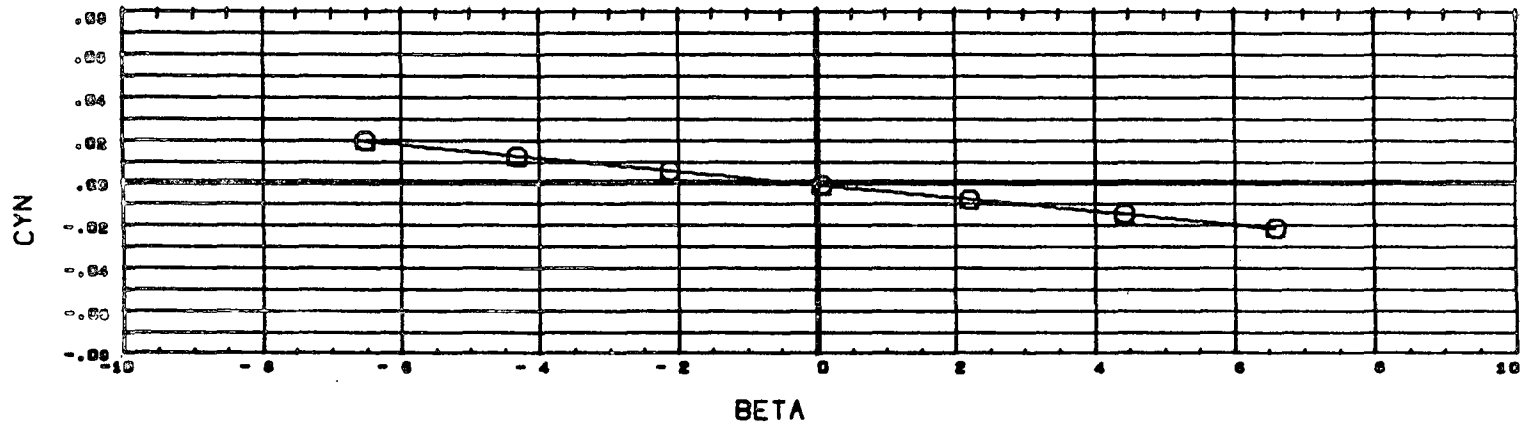
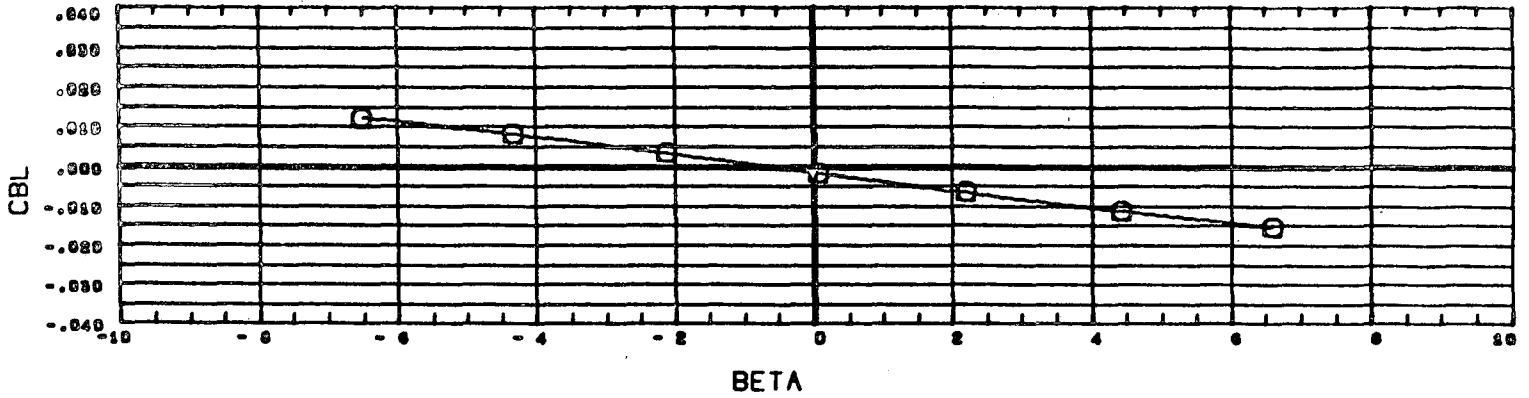
M513-MSFC MODELAR1216I-2

B5CW11AF2S1

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LATERAL STABILITY



SYMBOL D MACH 1.002 ALPHA 25.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

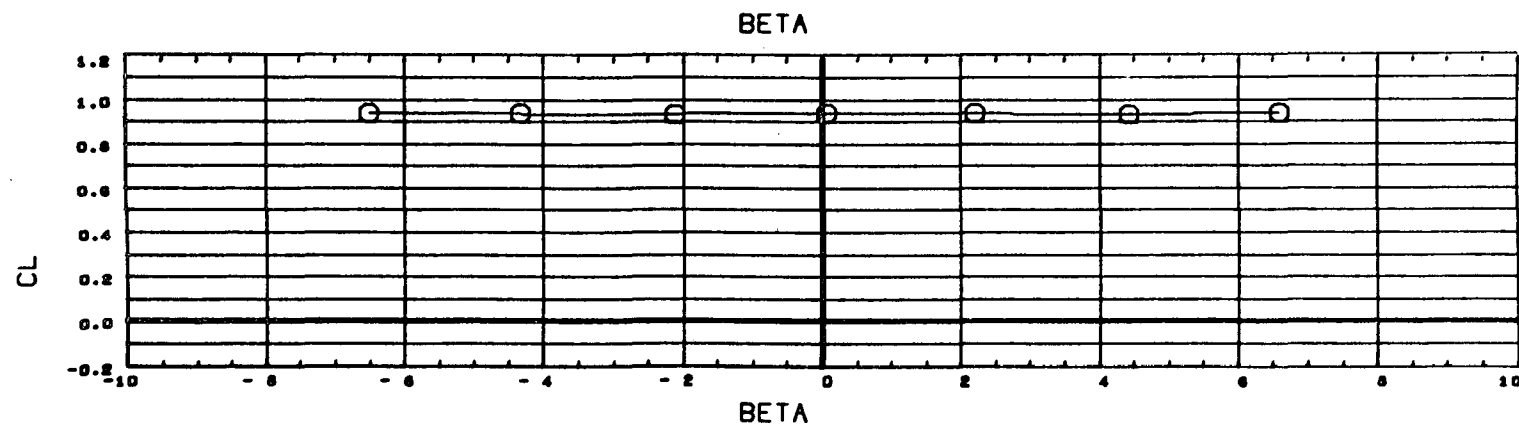
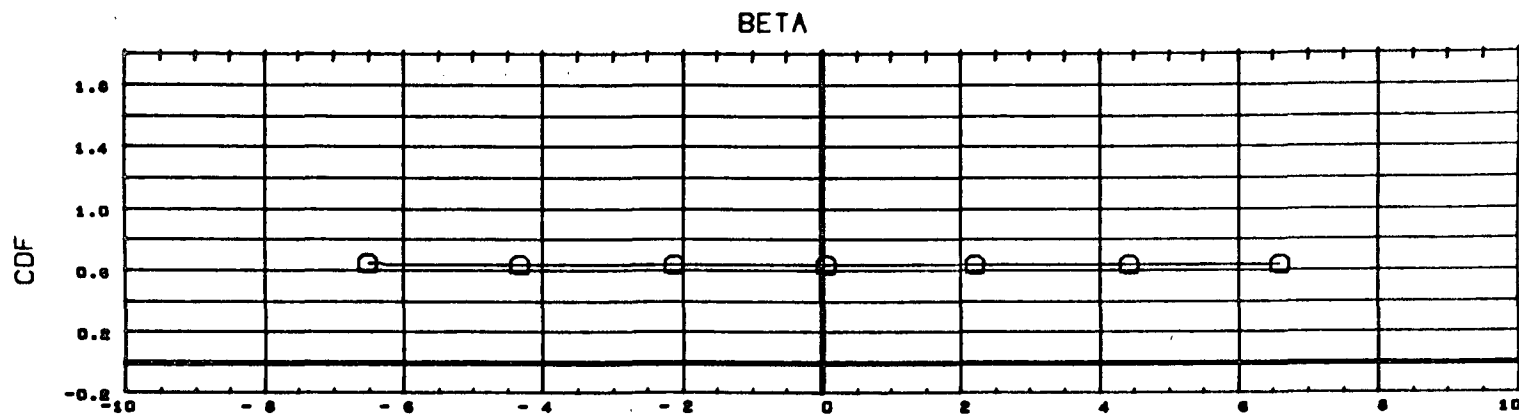
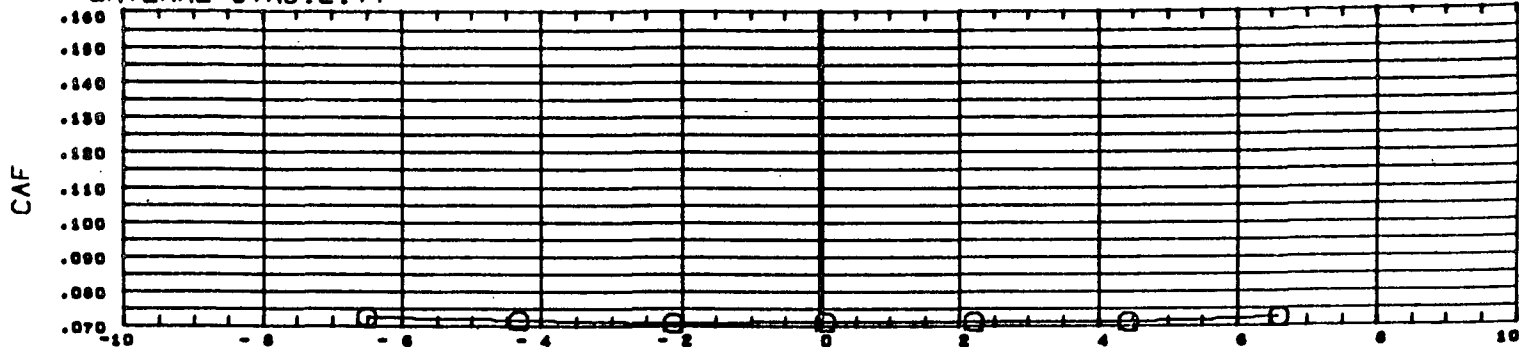
M513-MSFC MODELAR12161-2

B5CW11AF2S1

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LATERAL STABILITY



SYMBOL MACH ALPHA PARAMETRIC VALUES
 D 1.962 25.000

REFERENCE INFORMATION
 SREF 14.6636 30. IN.
 LREF 4.5080 IN.
 BREF 9.6550 IN.
 XMRP 1.4621 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC

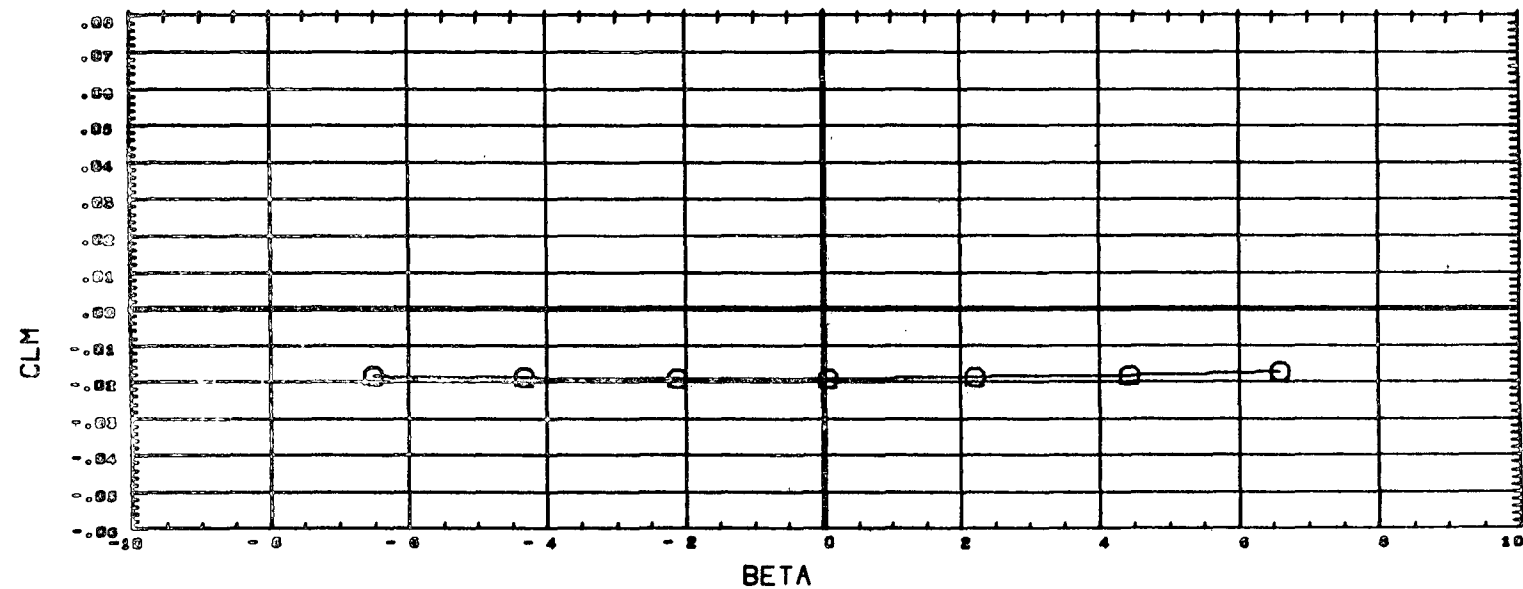
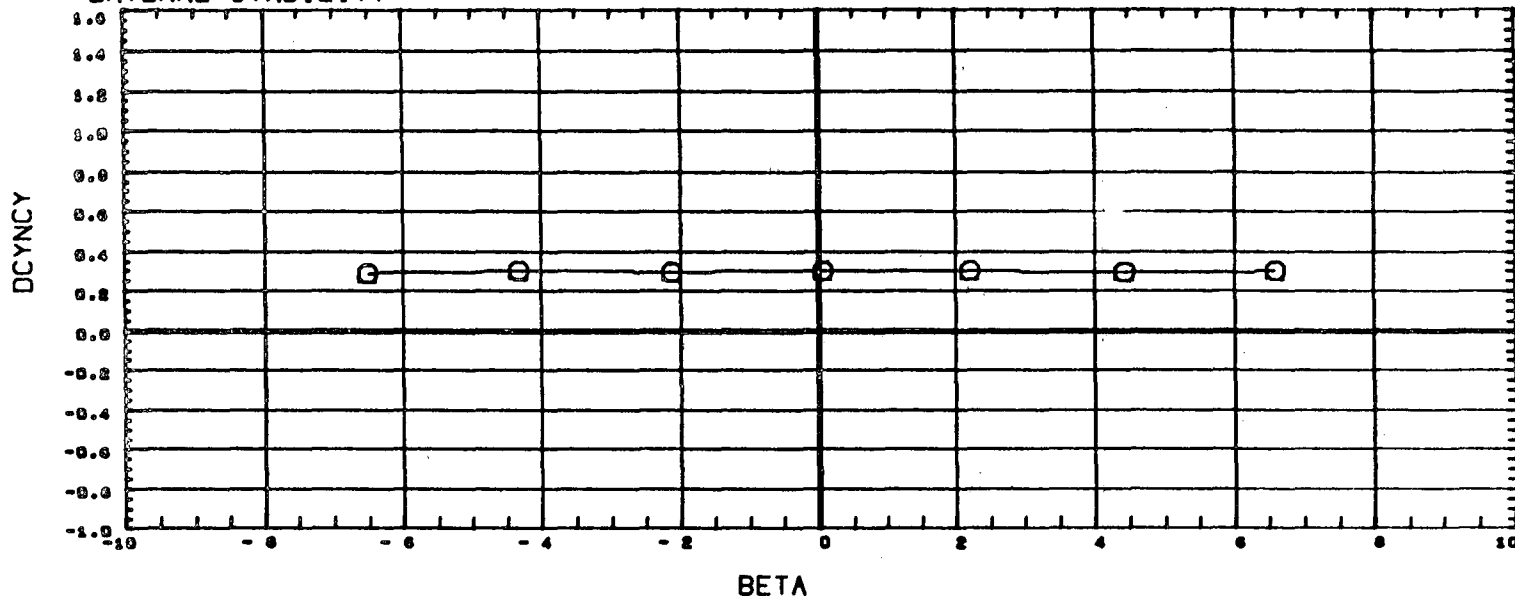
M513-MSFC MODELAR12161-2

B5CW11AF2S1

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LATERAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 O 1.968 ALPHA 25.000

REFERENCE INFORMATION

SREF	14.6836	89. IN.
LREF	4.5060	IN.
BREF	9.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

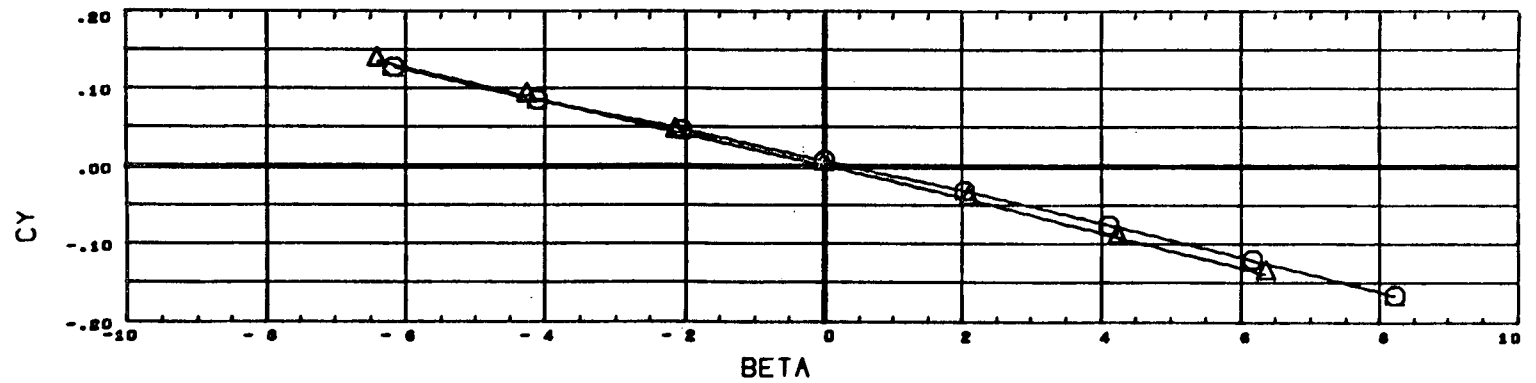
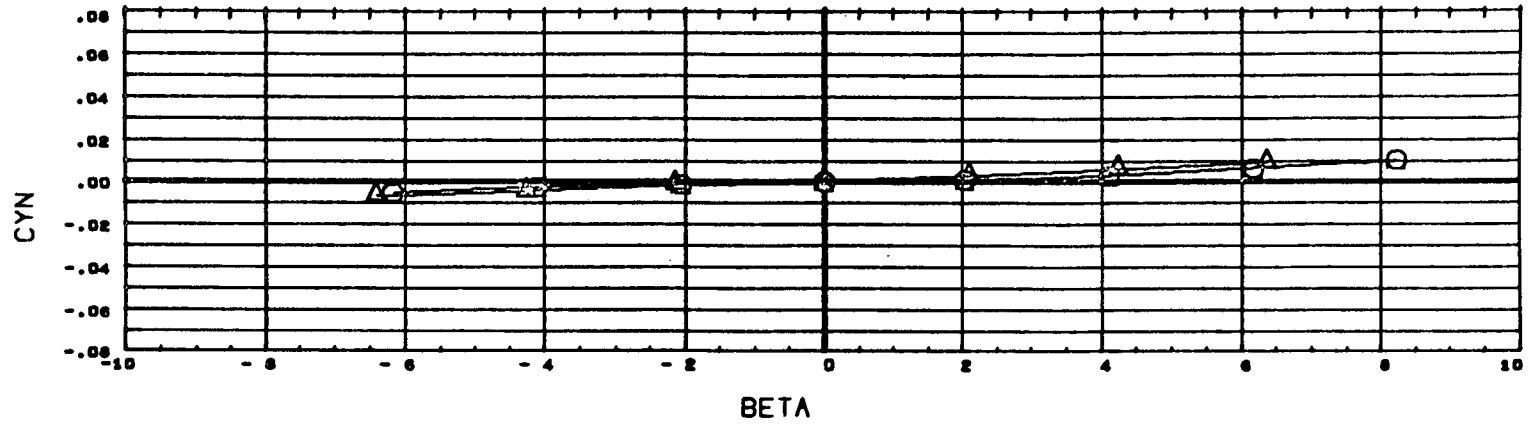
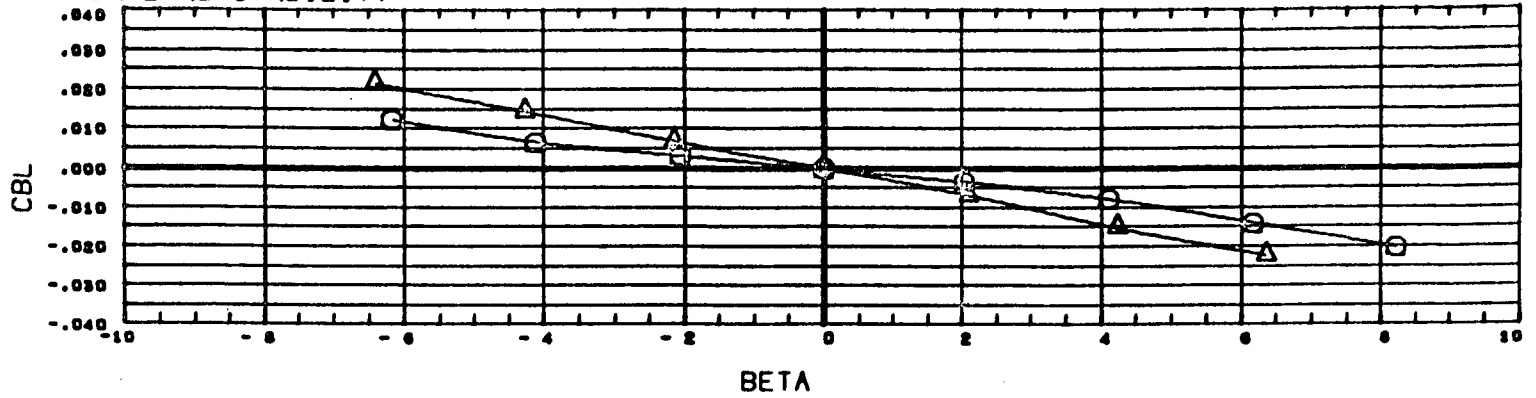
M513-MSFC MODELAR12161-2

B5CW11AF2S1

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LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
△	0.897	ALPHA	0.000	RUDDER	0.000
○	1.190	RUDFLR	30.000		

REFERENCE INFORMATION		
SREF	14.6036	80. IN.
LREF	4.5080	IN.
BREF	5.6550	IN.
XHRP	1.4821	IN.
YHRP	0.0000	IN.
ZHRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

M513-MSFC MODELAR12161-2

B5CW11AF2S1V7

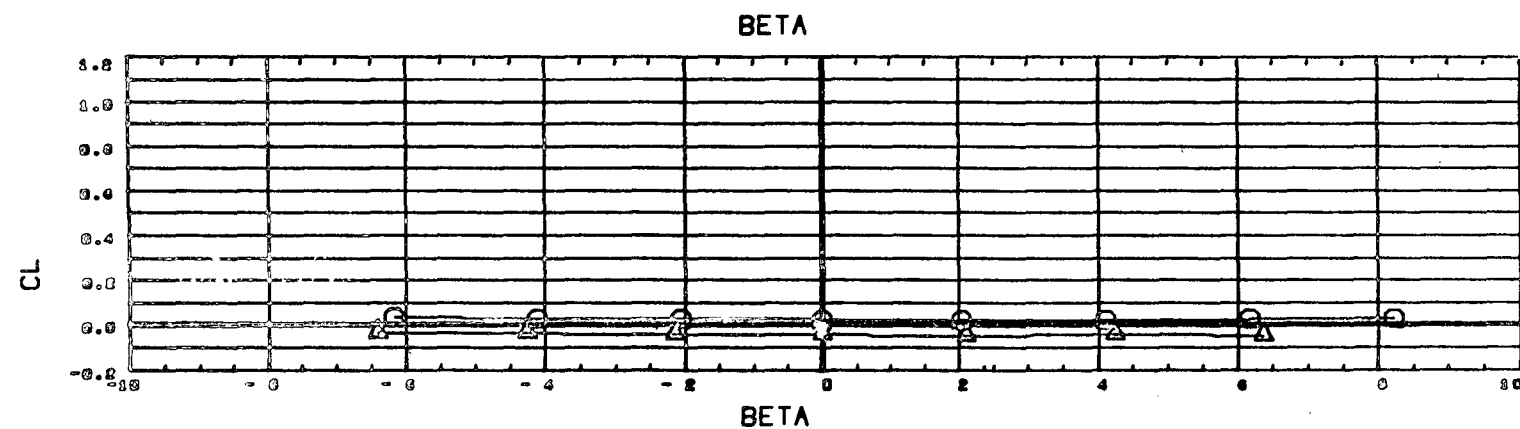
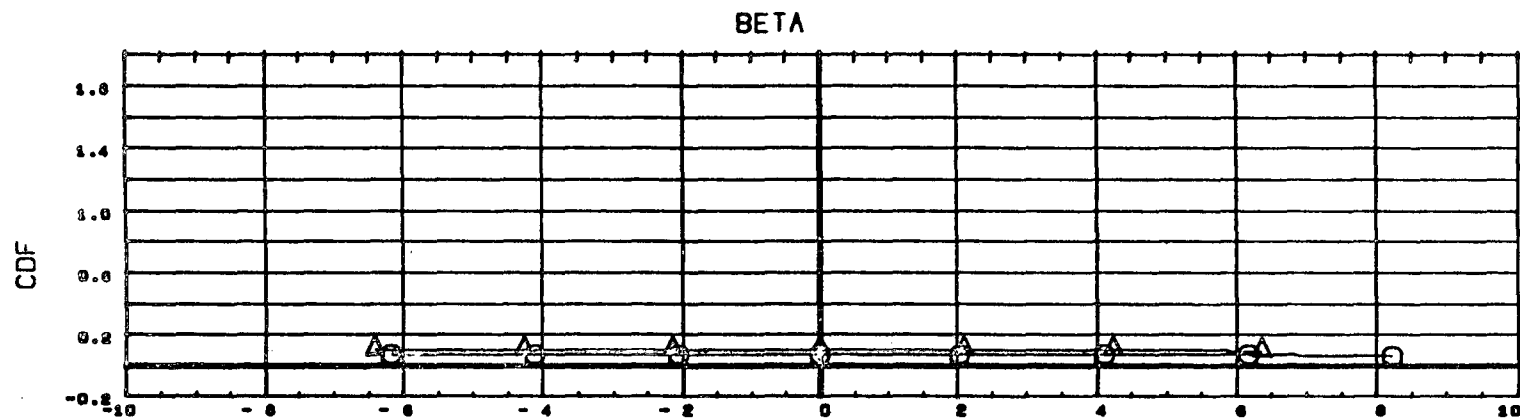
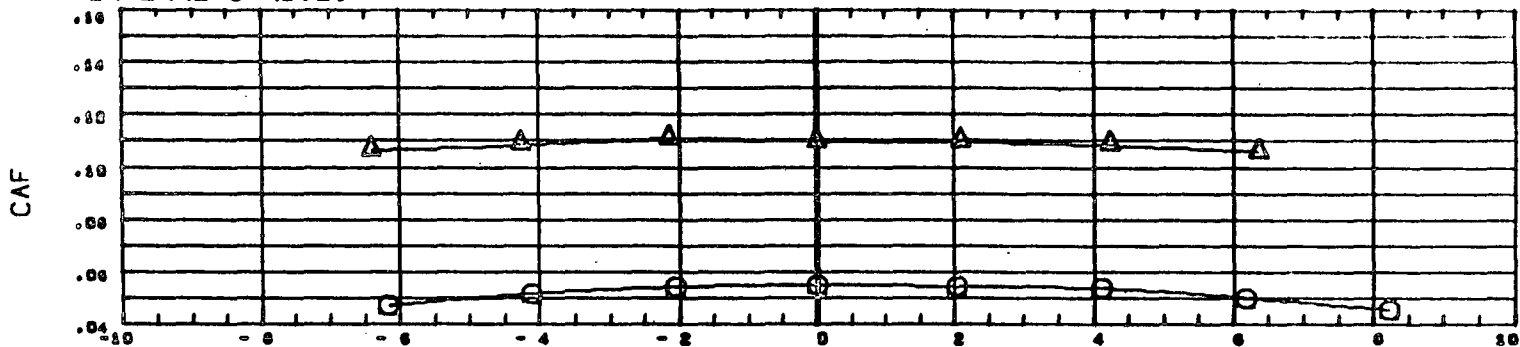
(C5305C)

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LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
△	0.997	ALPHA	0.000	RUDDER
○	1.100	RUDDLR	30.000	0.000

REFERENCE INFORMATION		
SREF	14.6836	88. IN.
LREF	4.5080	IN.
BREF	8.6550	IN.
XMRF	1.4621	IN.
YMRF	0.0000	IN.
ZMRF	0.0000	IN.
SCALE	0.0034	

DATA MIST. CODE GC

M513-MSFC MODELAR12161-2

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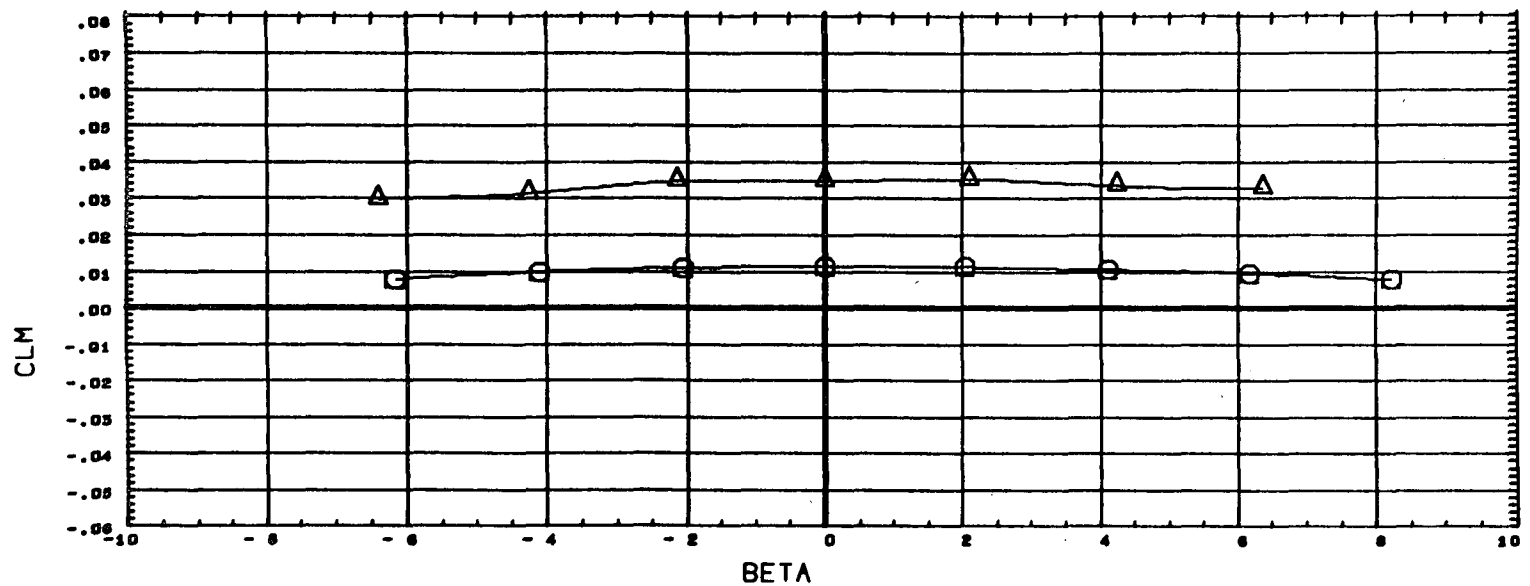
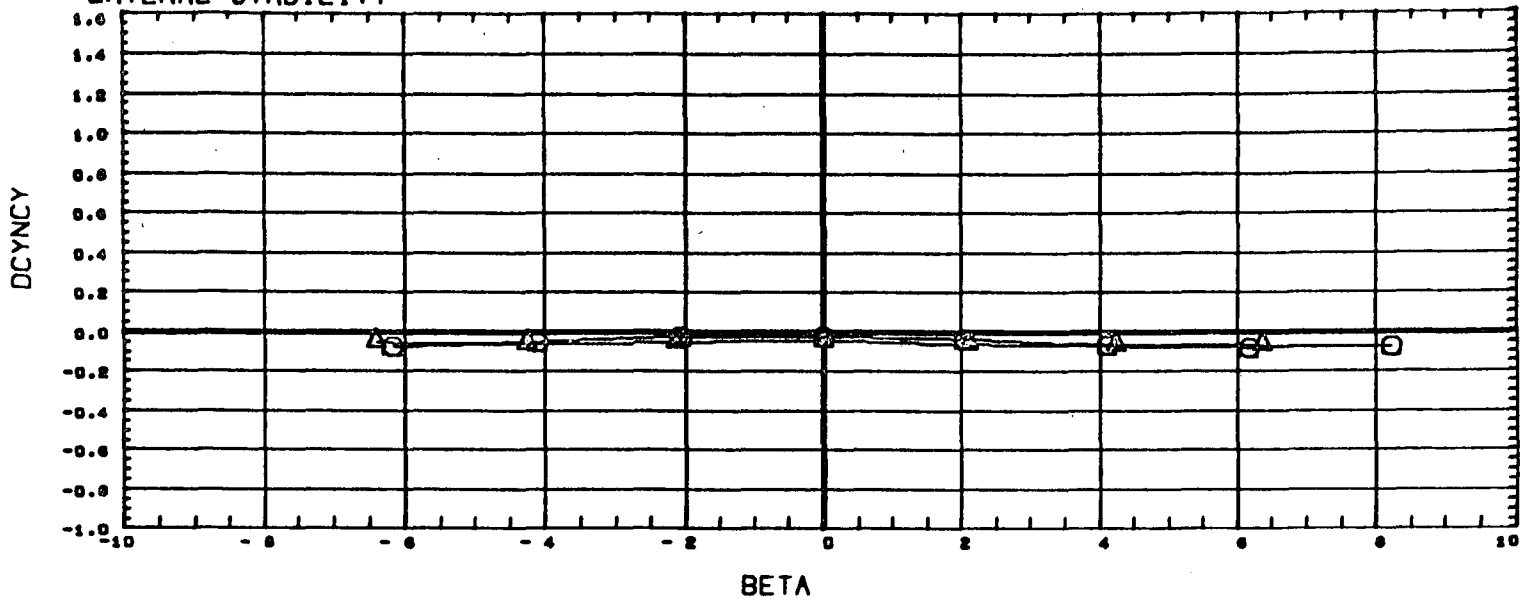
(C5305C)

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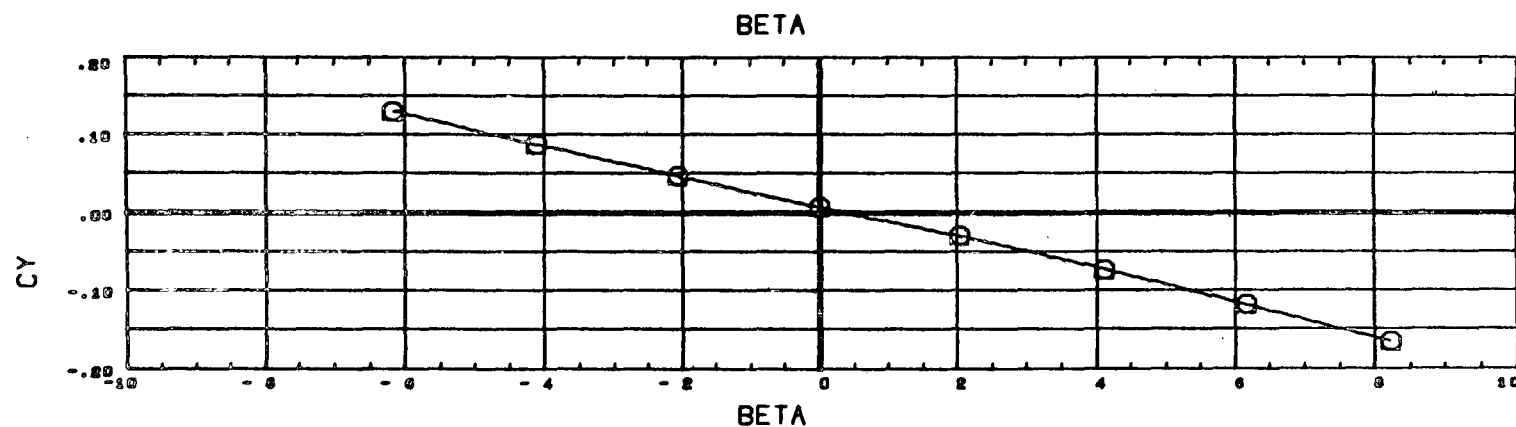
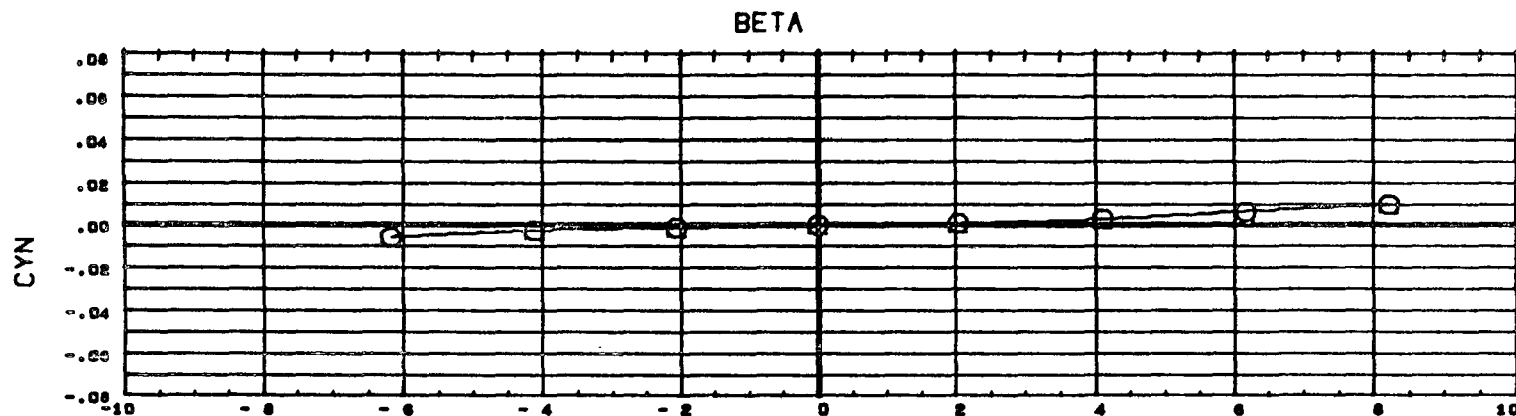
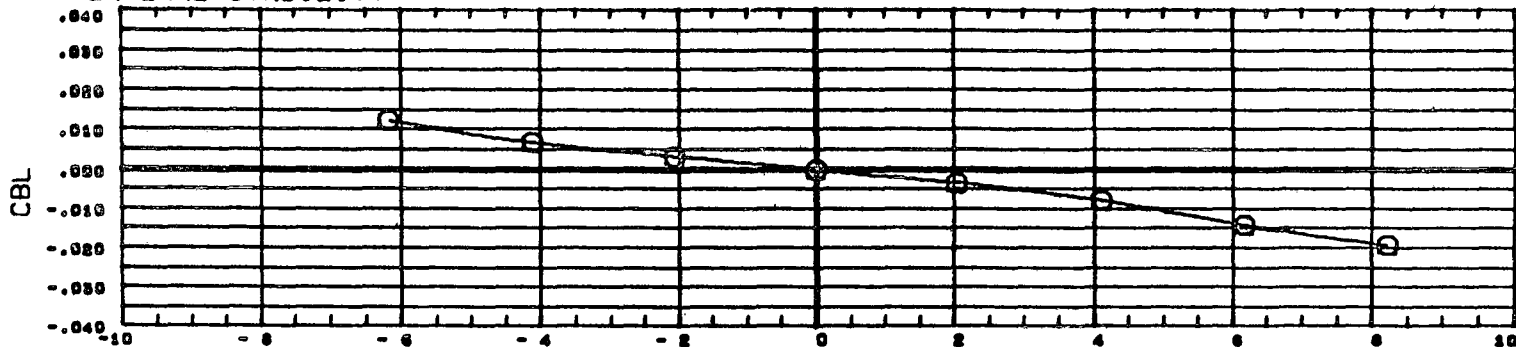


SYMBOL	MACH	PARAMETRIC VALUES			
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△	1.199	RUDFLR	30.000		

REFERENCE INFORMATION		
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LREF	4.5060	in.
BREF	5.6550	in.
XMRP	1.4621	in.
YMRP	0.0000	in.
ZMRP	0.0000	in.
SCALE	0.0034	

DATA HIST. CODE GC

LATERAL STABILITY



SYMBOL \bigcirc MACH 0.599 ALPHA 0.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
 SREF 14.6836 80. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
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 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

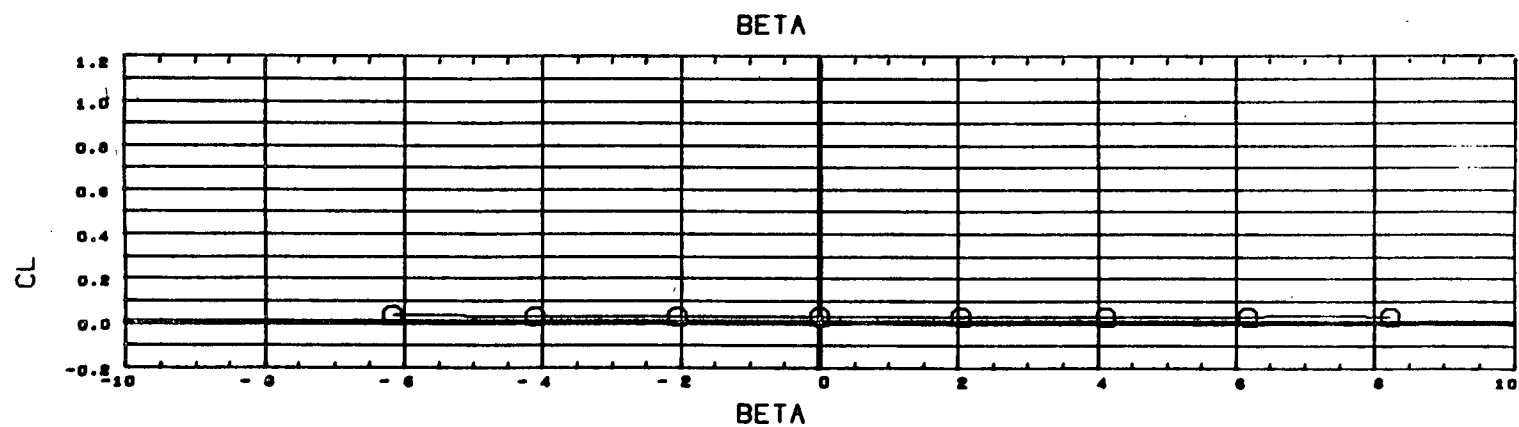
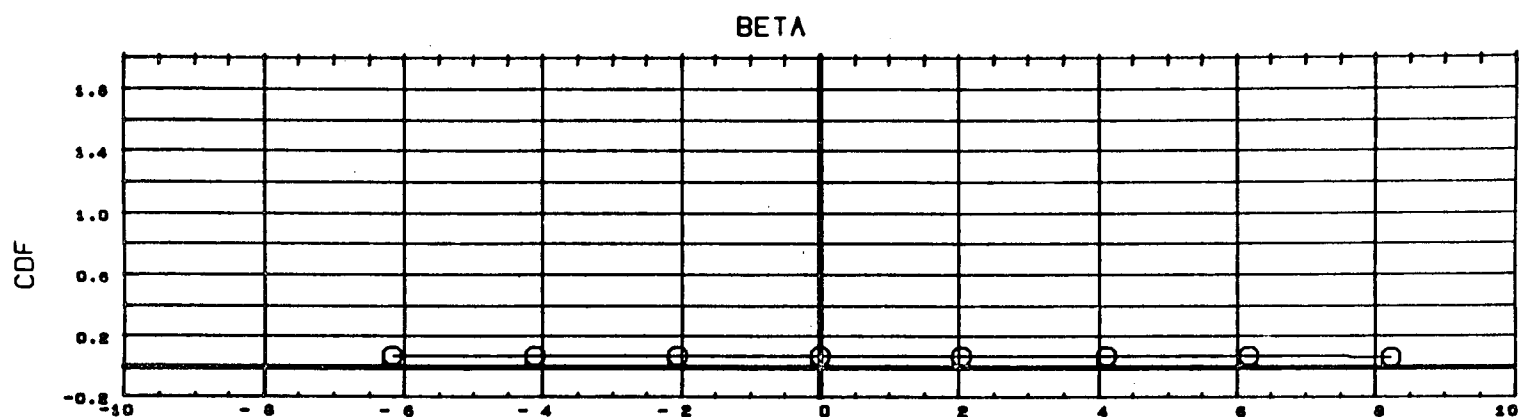
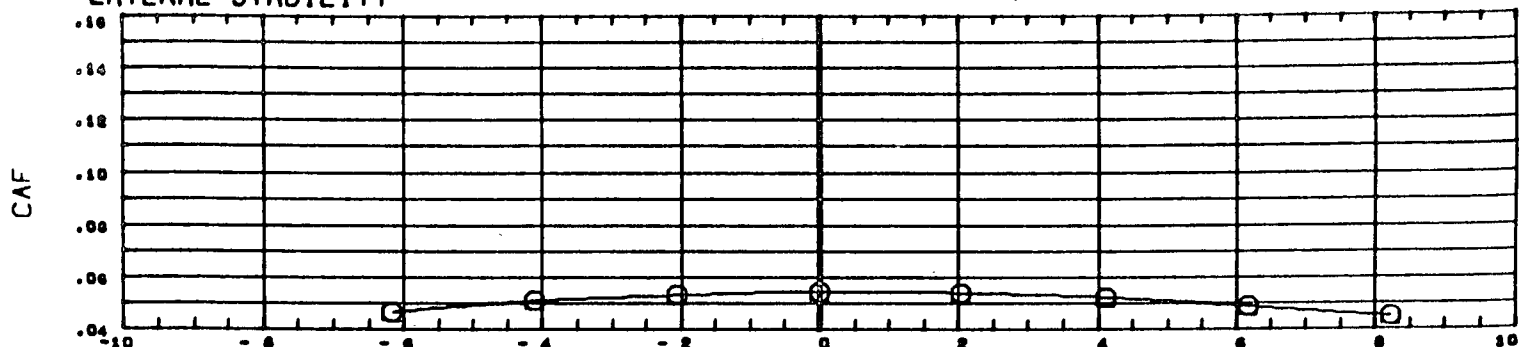
M513-MSFC MODELAR1216I-2

B5CW11AF2S1V7 TS0 (C5305X)

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LATERAL STABILITY



SYMBOL ☐ MACH 0.599
 PARAMETRIC VALUES
 ALPHA 0.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
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 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

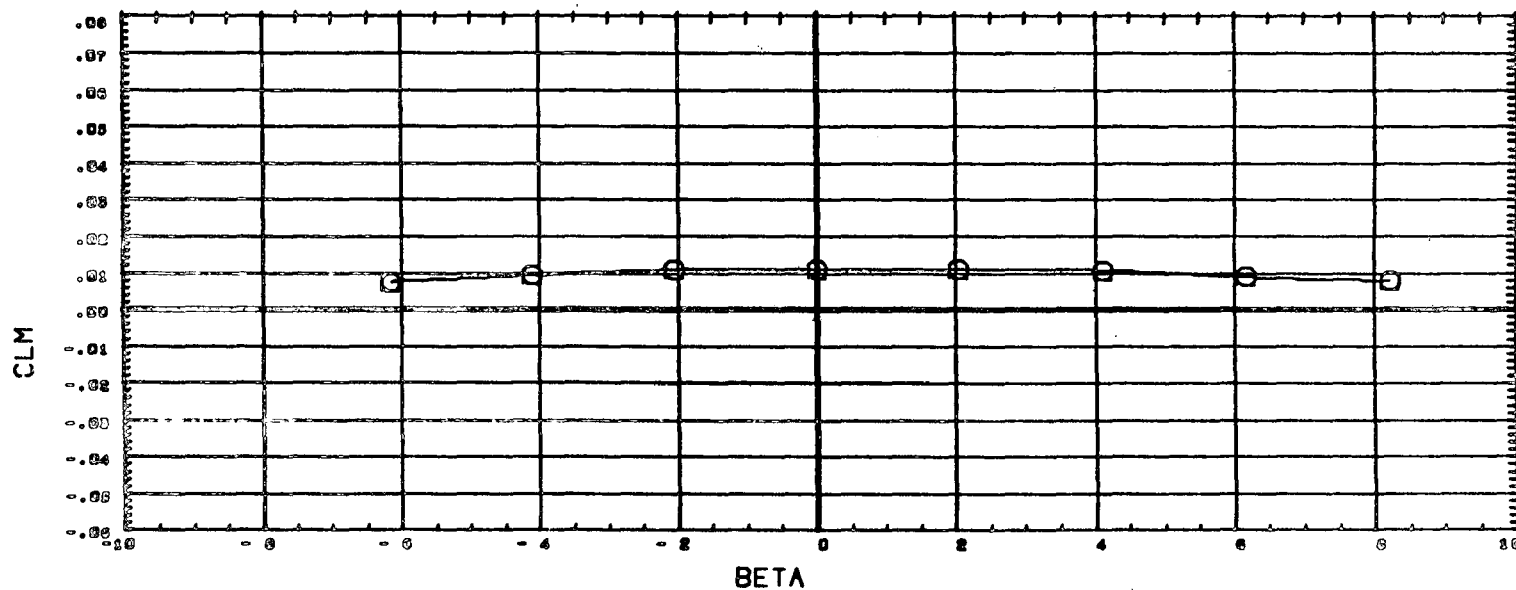
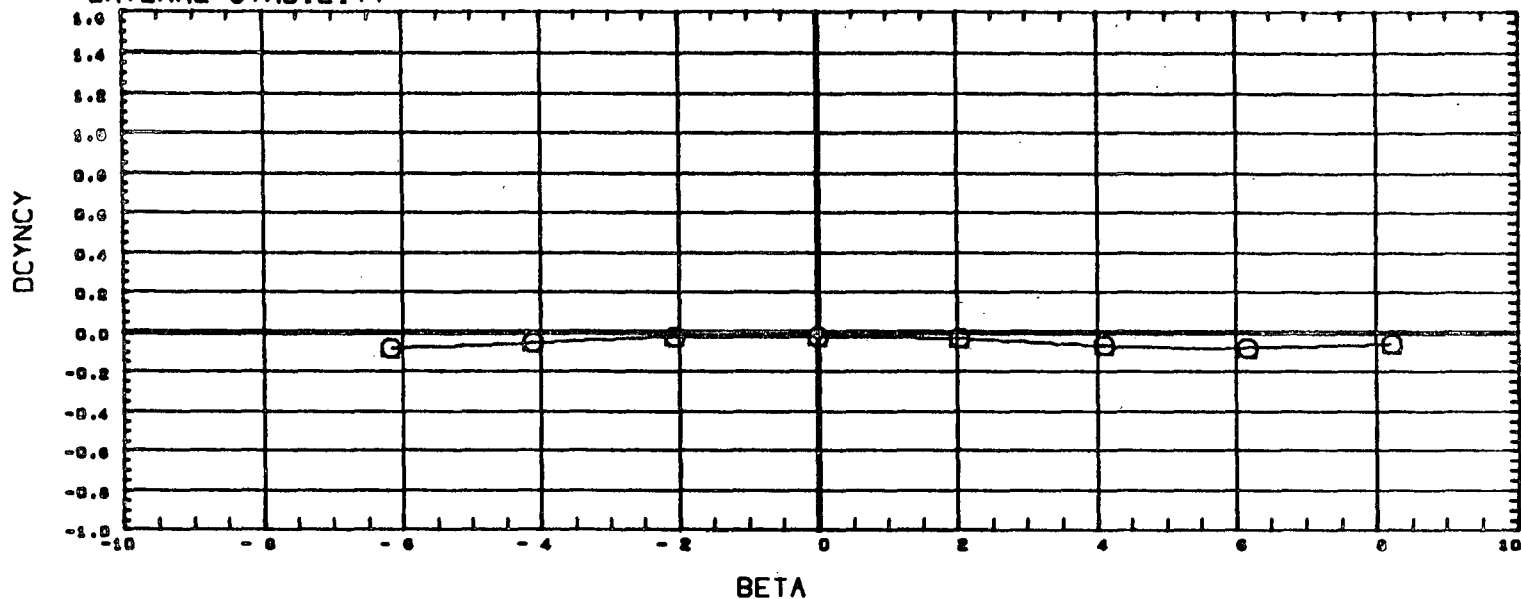
M513-MSFC MODELAR1216I-2

B5CW11AF2S1V7 TS0 (C5305X)

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LATERAL STABILITY

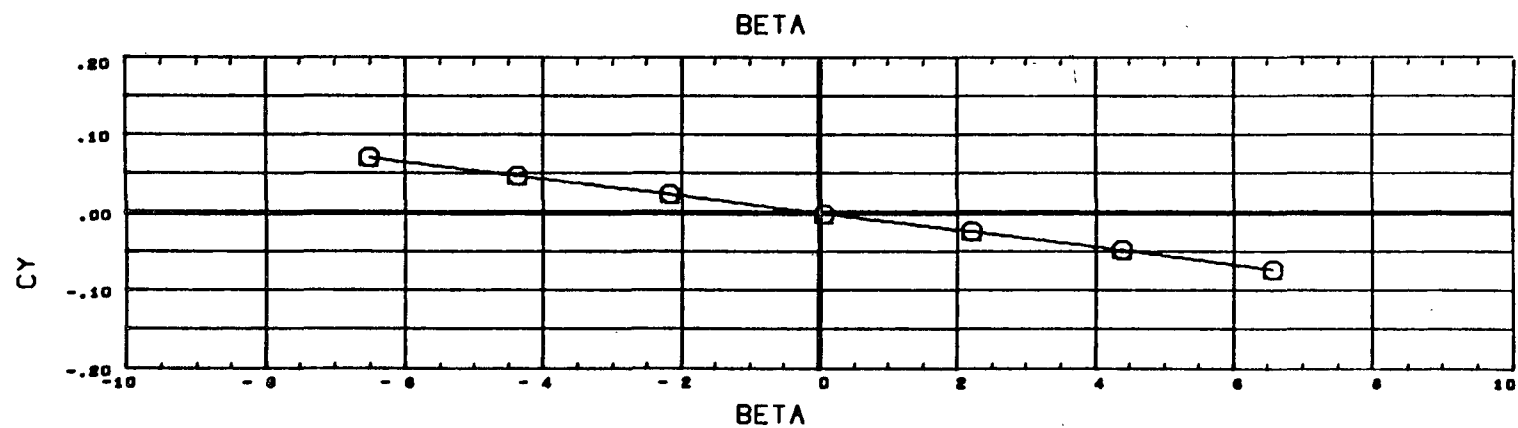
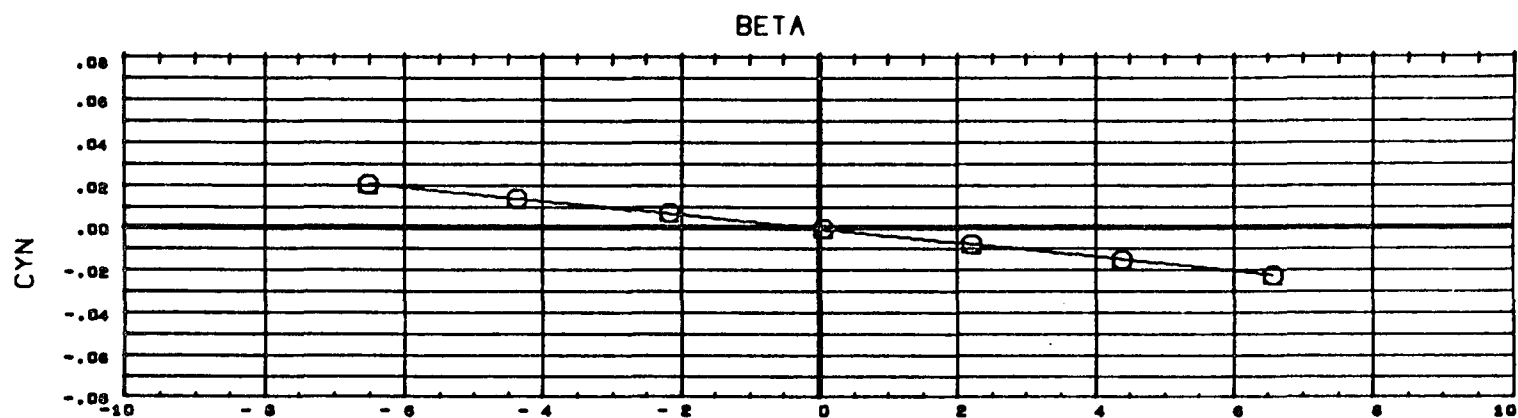
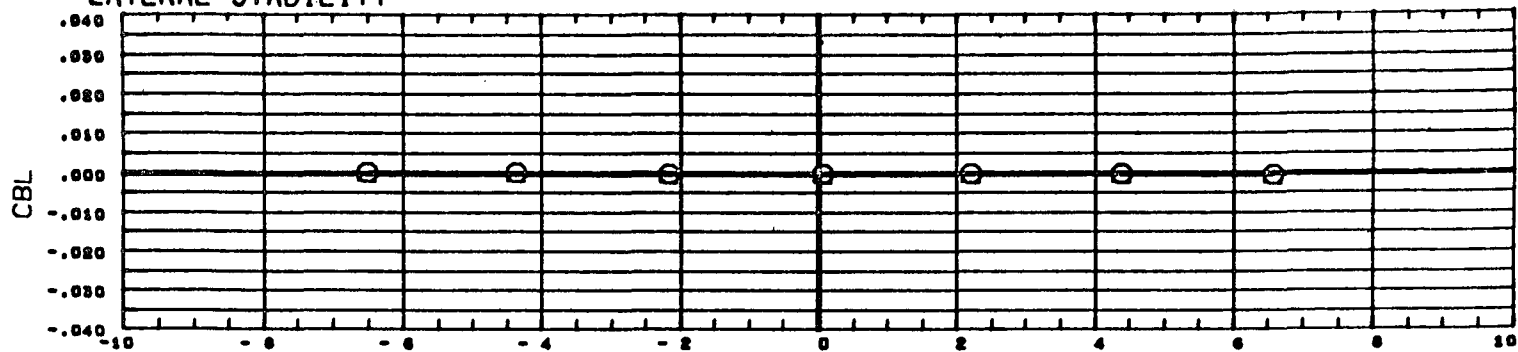


SYMBOL \square NACH 0.590
 PARAMETRIC VALUES
 ALPHA 0.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
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 LREF 4.3080 IN.
 BREF 3.6350 IN.
 XMRP 1.4821 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA MIST. CODE 6C

LATERAL STABILITY



SYMBOL \square MACH 1.057 ALPHA 25.000
 PARAMETRIC VALUES

REFERENCE INFORMATION
 SREF 14.6836 88. IN.
 LREF 4.5080 IN.
 BREF 9.6550 IN.
 XMRP 1.4821 IN.
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 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

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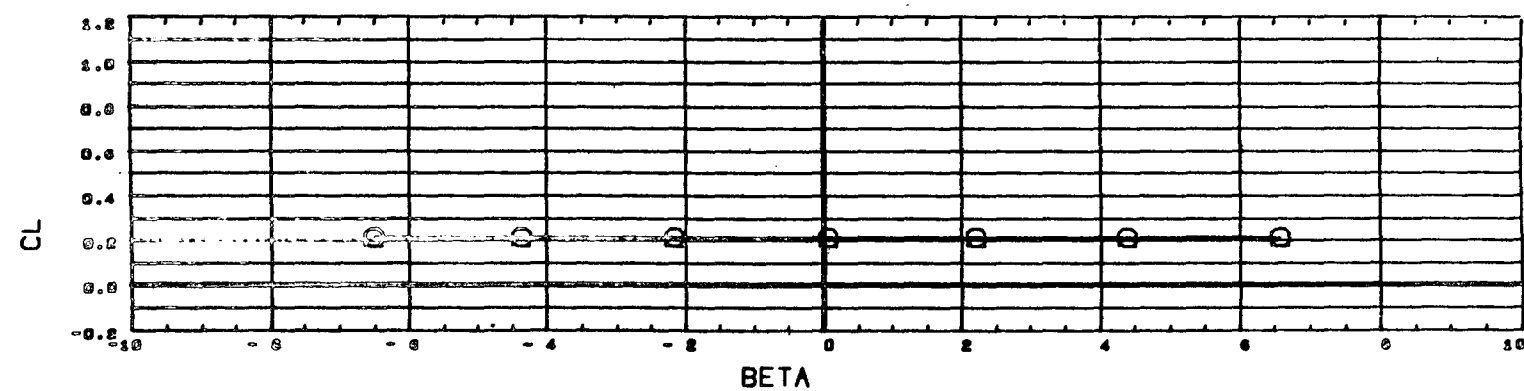
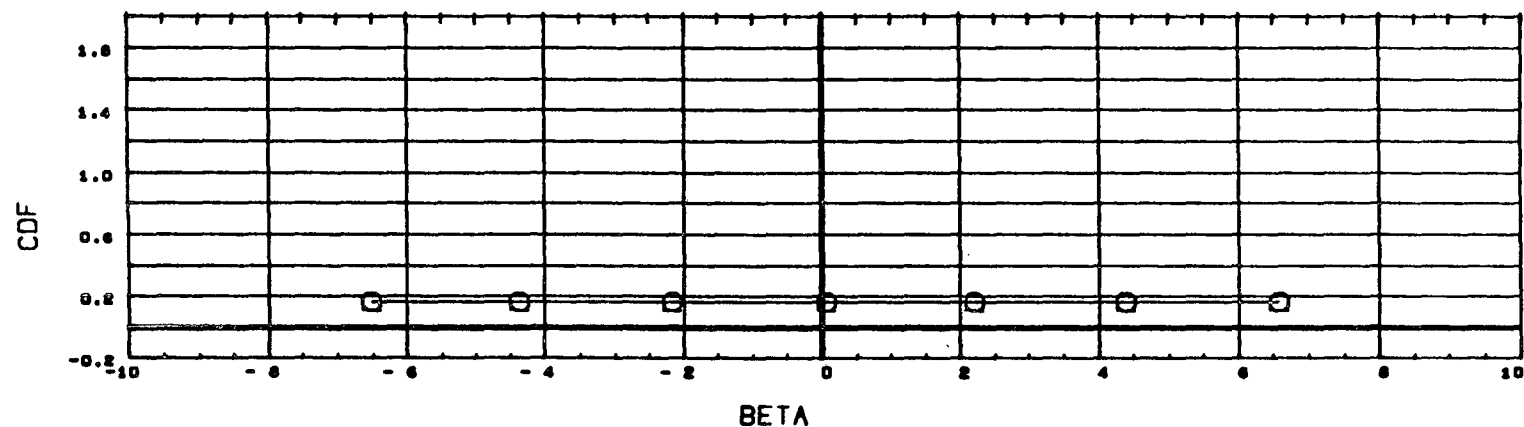
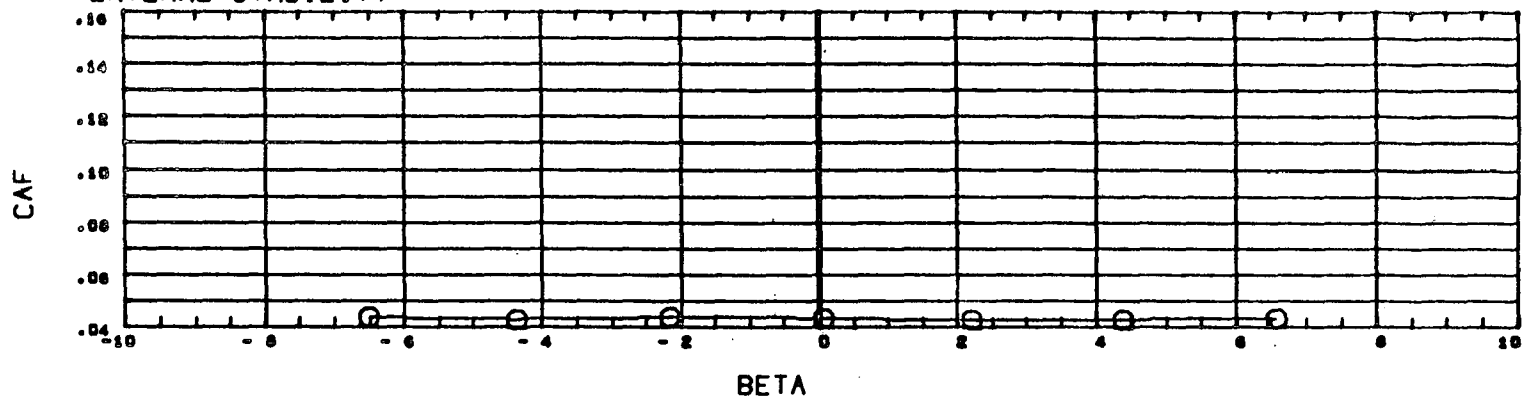
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257

LATERAL STABILITY



SYMBOL \square MACH 1.987 ALPHA 25.000
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REFERENCE INFORMATION
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 LREF 4.5080 IN.
 BREF 9.6550 IN.
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 YNRP 0.0000 IN.
 ZNRP 0.0000 IN.
 SCALE 0.0034

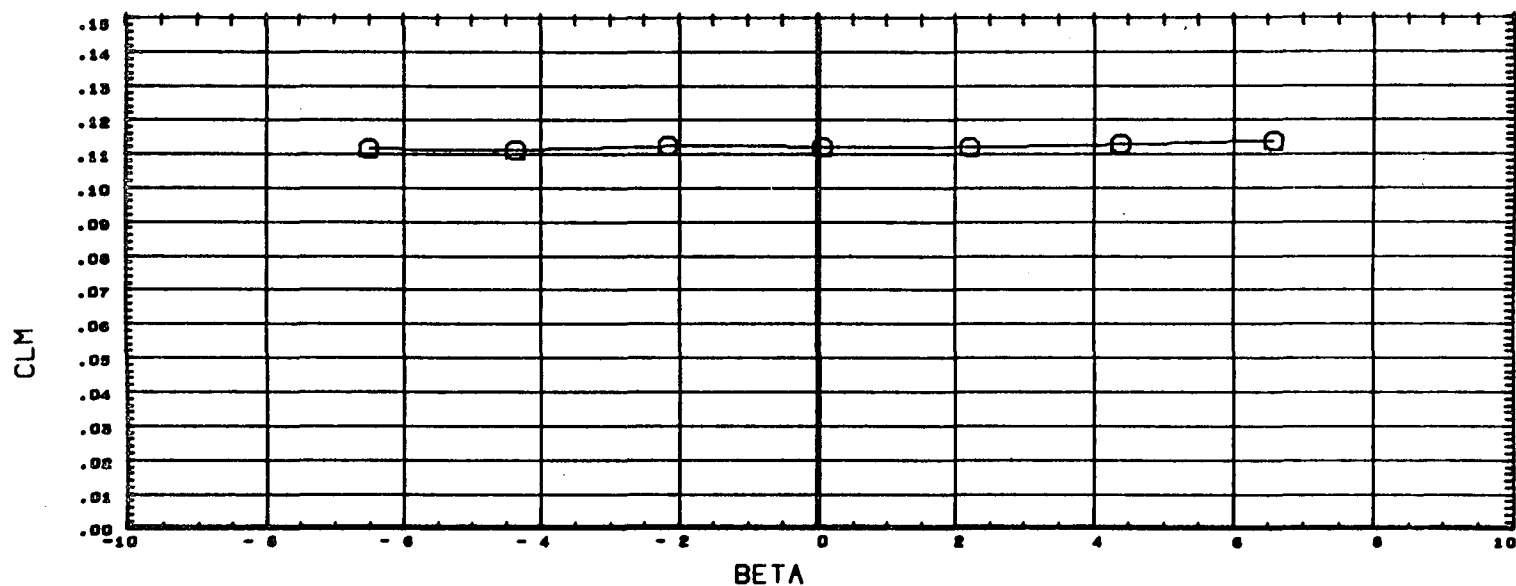
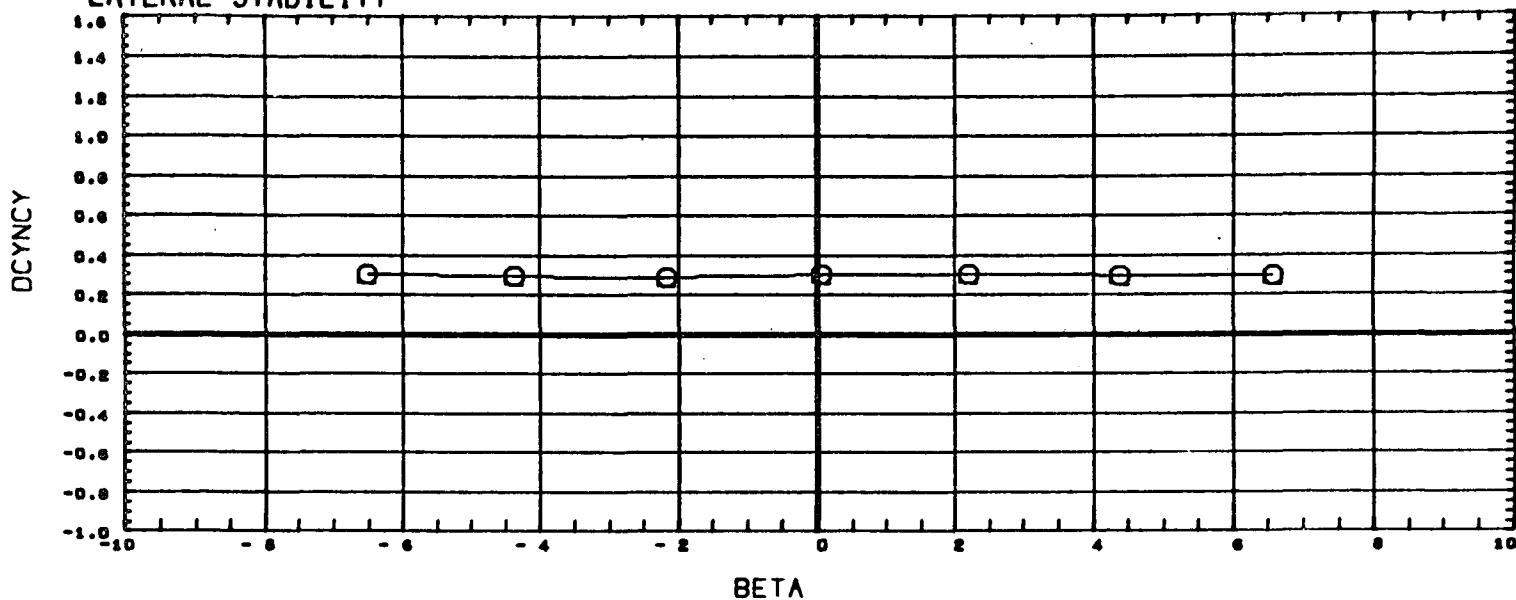
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B5CS1

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SYMBOL MACH PARAMETRIC VALUES
 ○ 1.957 ALPHA 25.000

DATA HIST. CODE 6C

REFERENCE INFORMATION
 SREF 14.6836 88. IN.
 LREF 4.5080 IN.
 BREF 5.6550 IN.
 XHRP 1.4621 IN.
 YHRP 0.0000 IN.
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 SCALE 0.0034

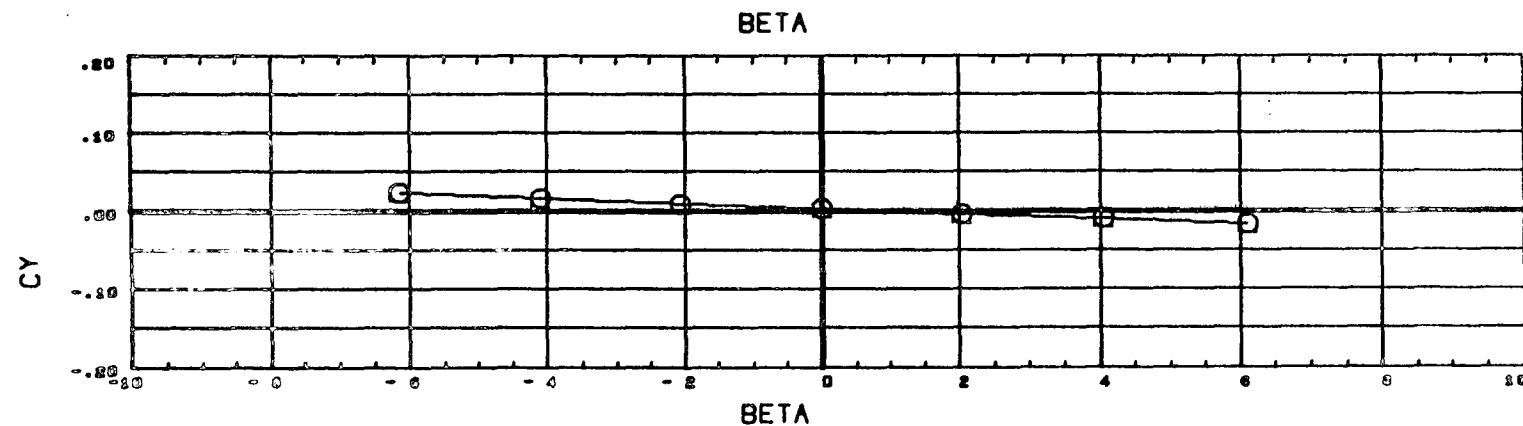
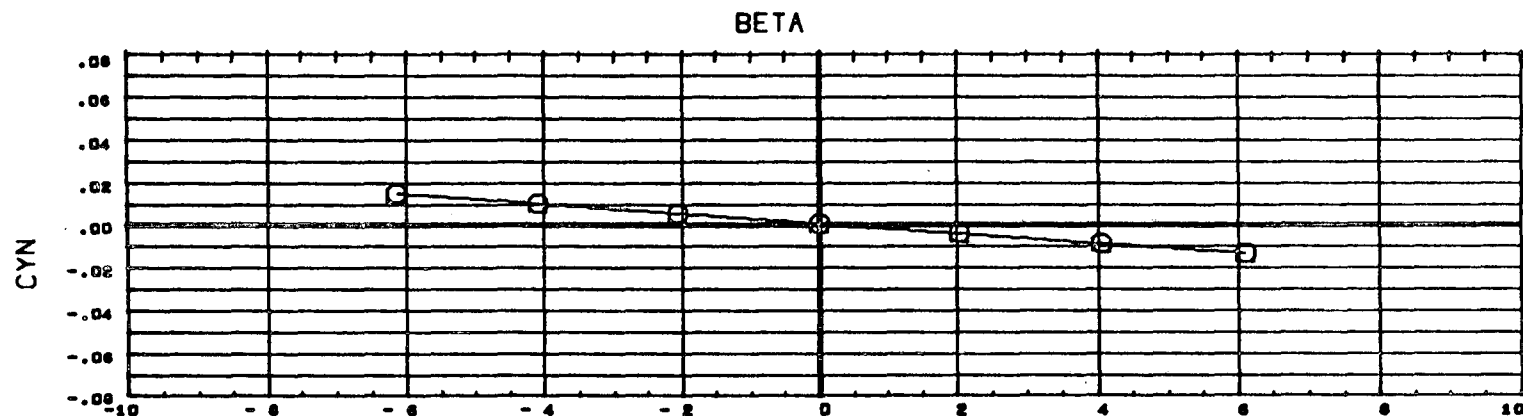
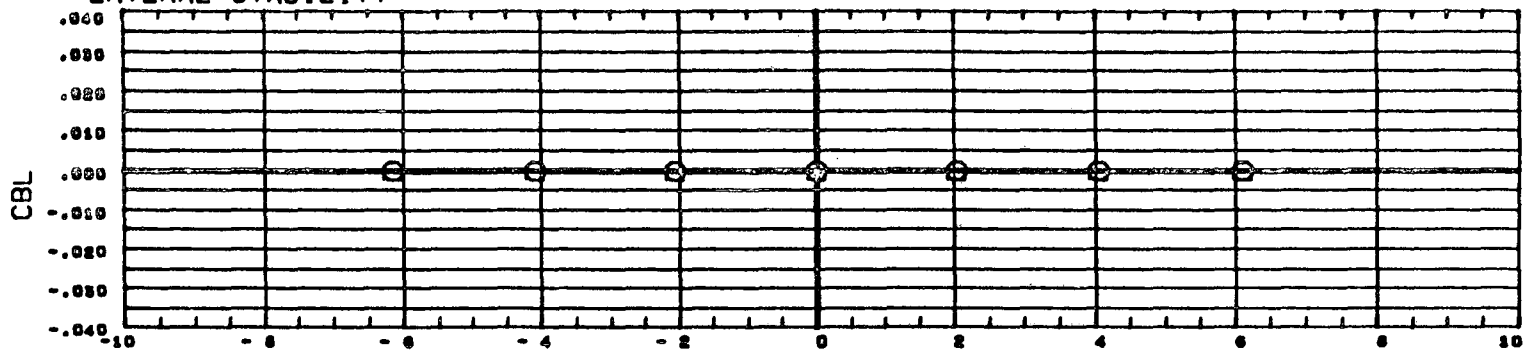
M513-MSFC MODELAR1216I-2

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SYMBOL MACH ALPHA PARAMETRIC VALUES
 ○ 0.001 10.000

REFERENCE INFORMATION
 BREF 14.6836 80. IN.
 LREF 4.5000 IN.
 BREF 5.6550 IN.
 XMRP 1.4821 IN.
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 SCALE 0.0034

DATA HIGH. CODE 6C

M513-MSFC MODELAR1216I-2

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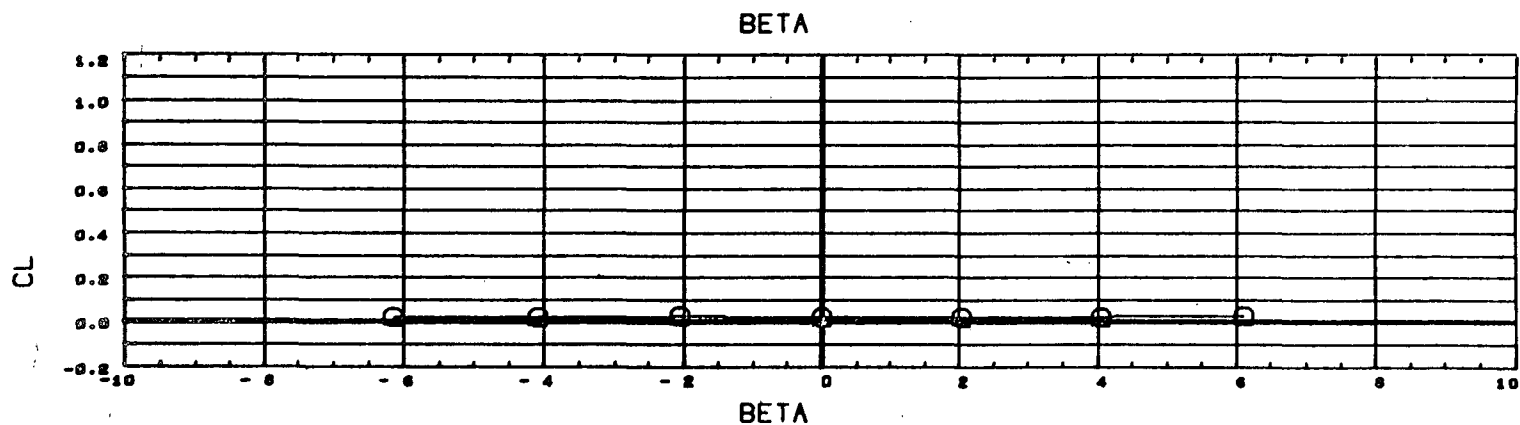
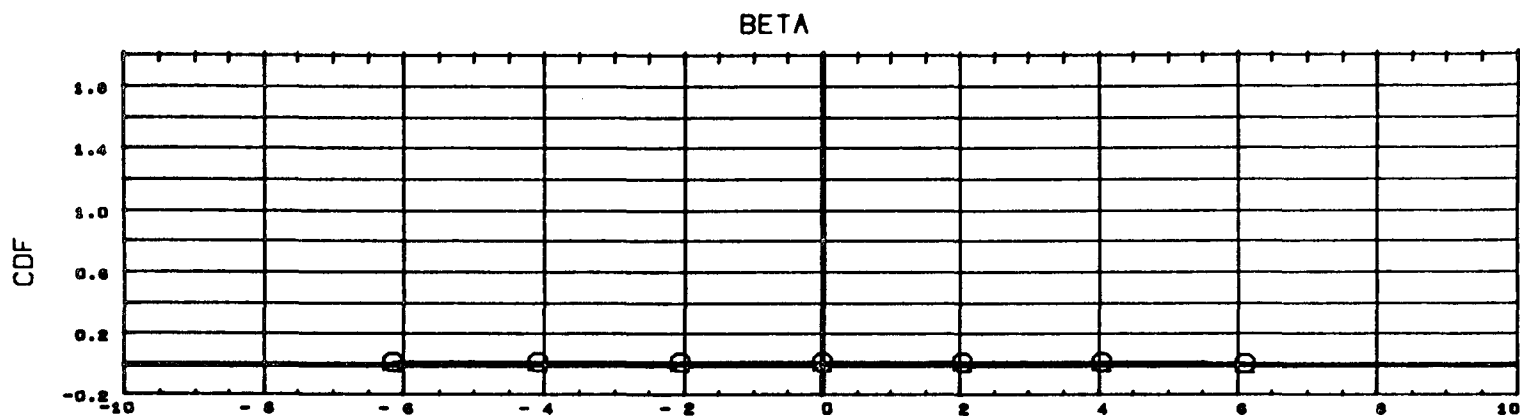
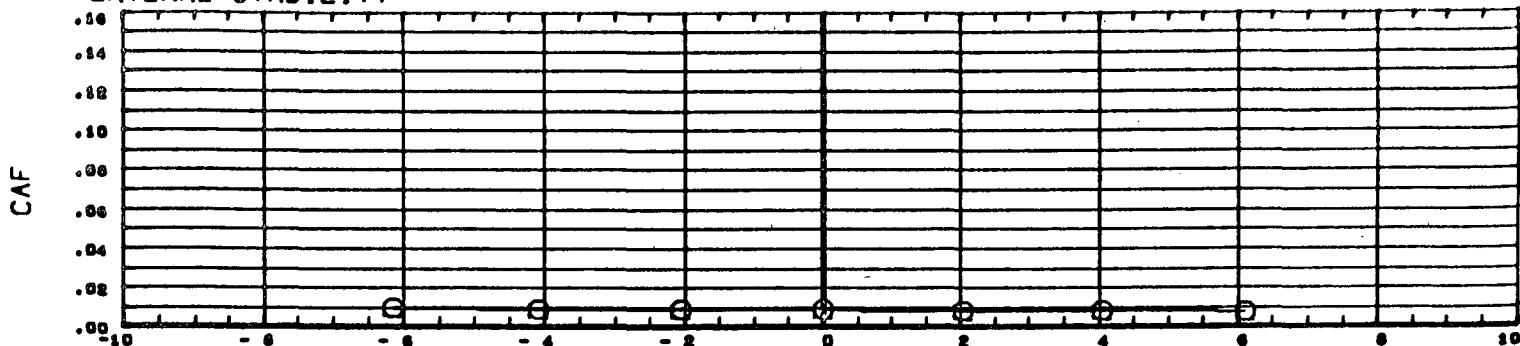
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LATERAL STABILITY



SYMBOL  MACH 0.001 ALPHA 10.000

REFERENCE INFORMATION
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 SCALE 0.0034

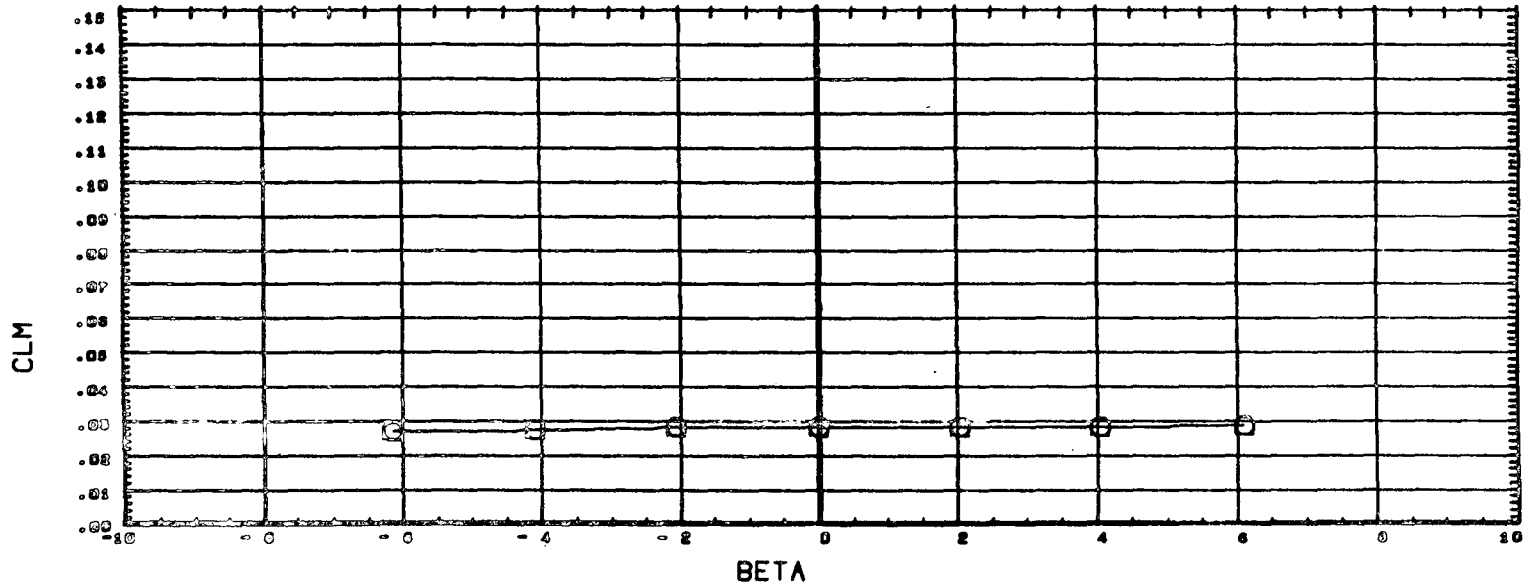
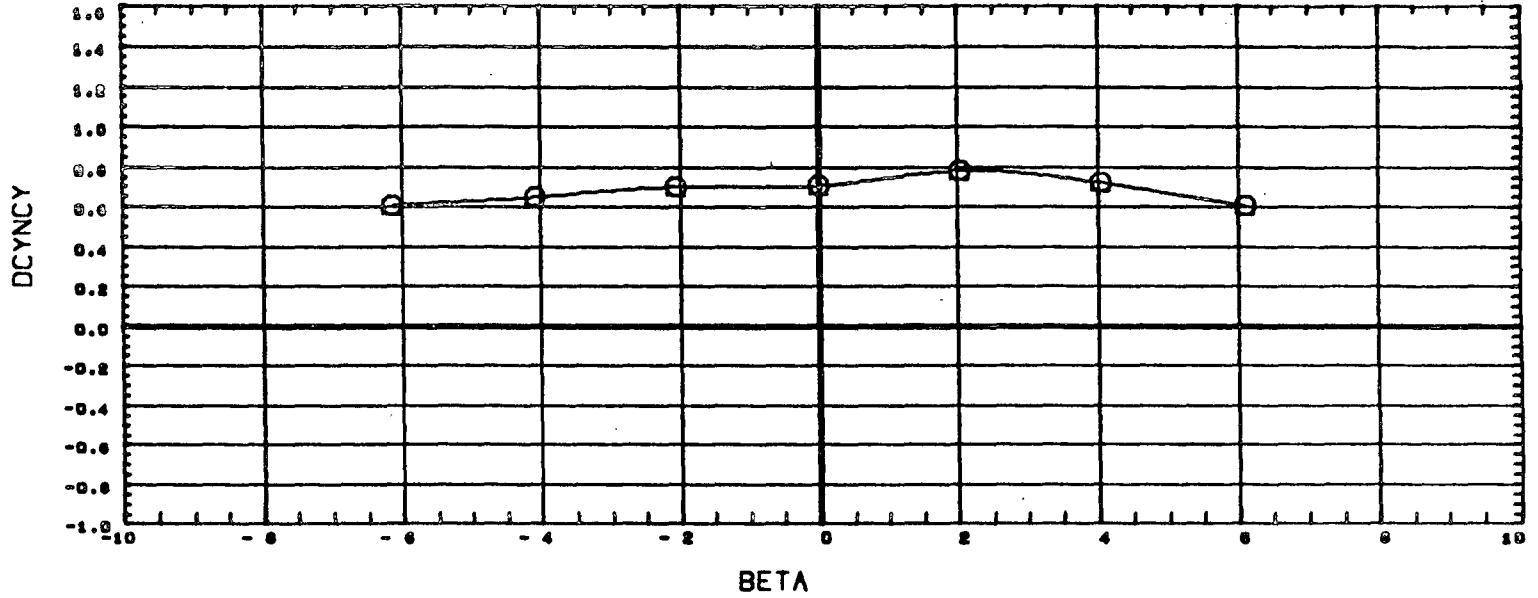
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LATERAL STABILITY



SYMBOL MACH 0.601 ALPHA 10.000

REFERENCE INFORMATION
 SREF 14.6636 SQ. IN.
 LREF 4.5080 IN.
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 XMRP 1.4621 IN.
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 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

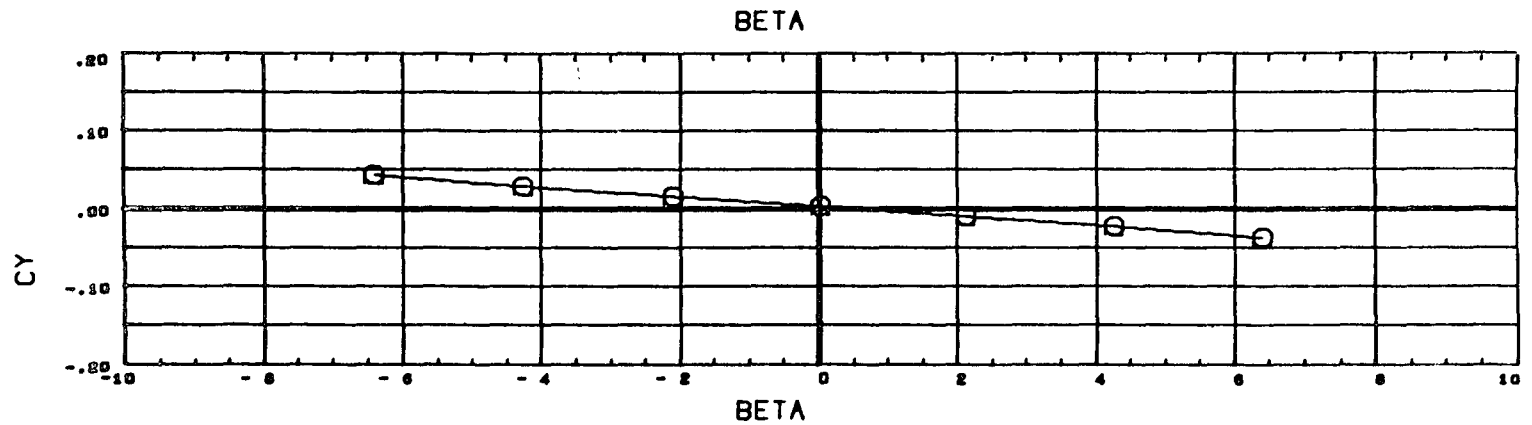
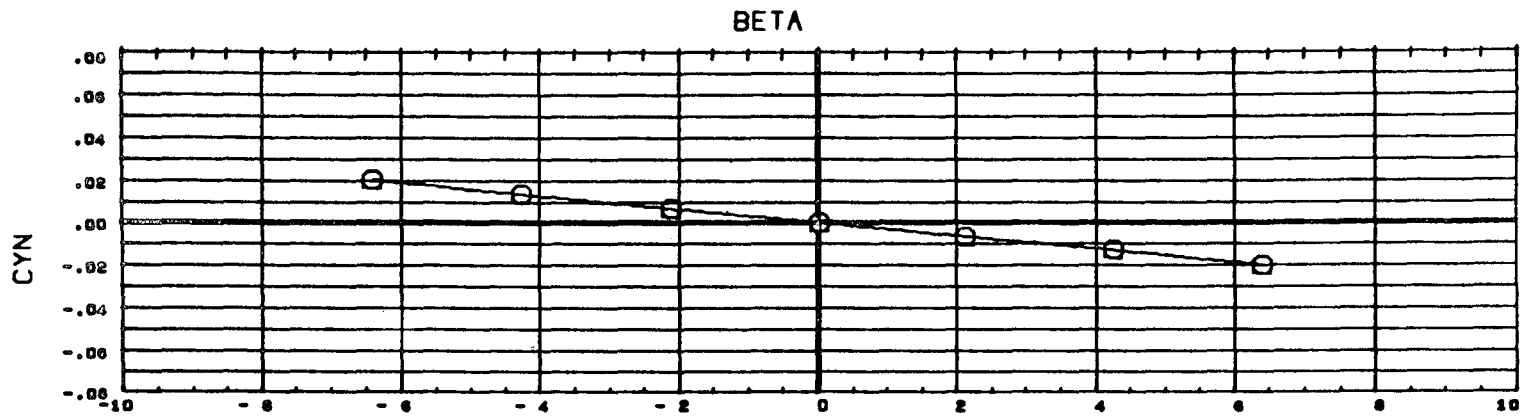
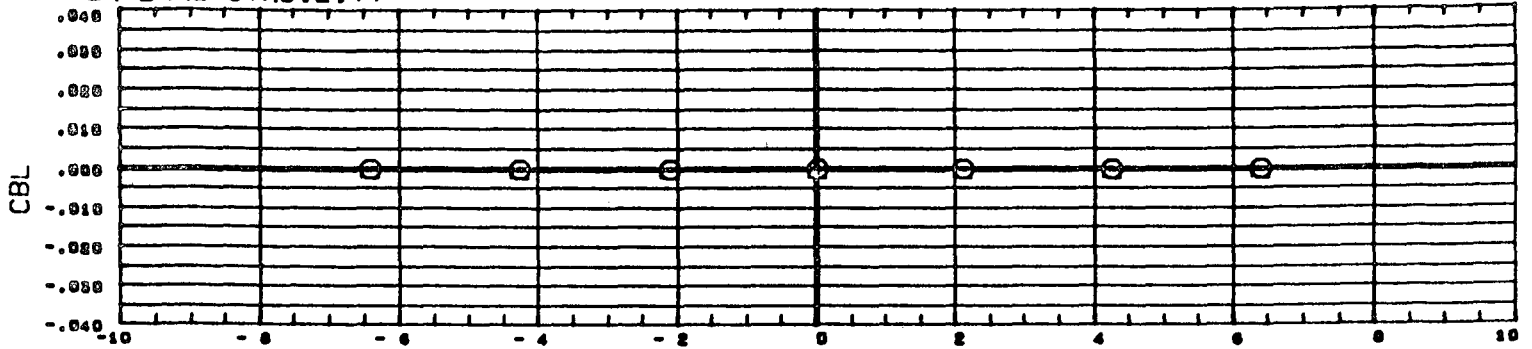
M513-MSFC MODELAR12161-2

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LATERAL STABILITY

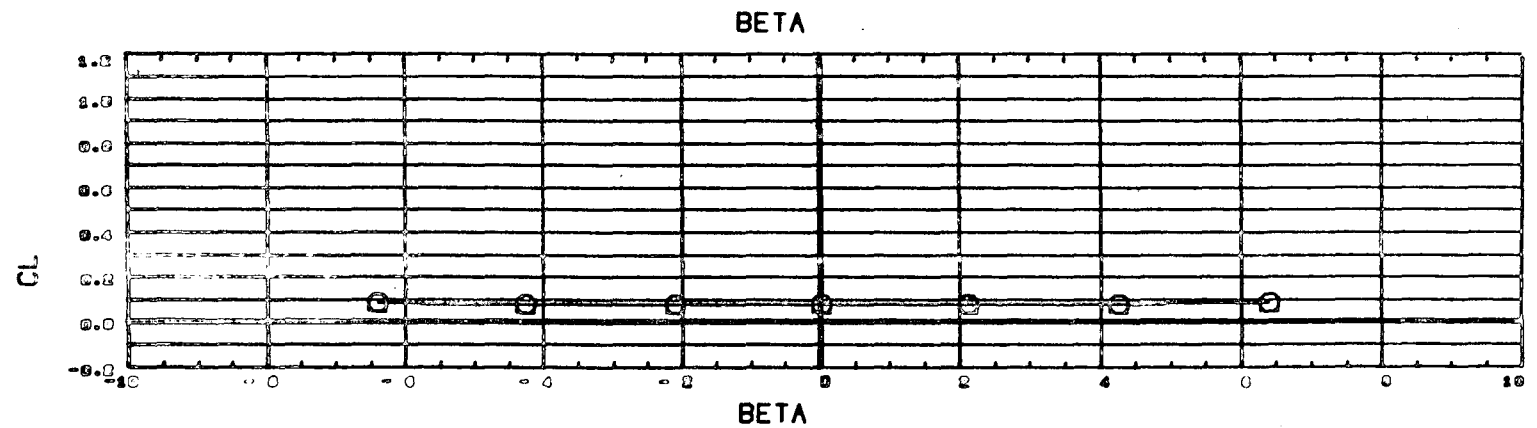
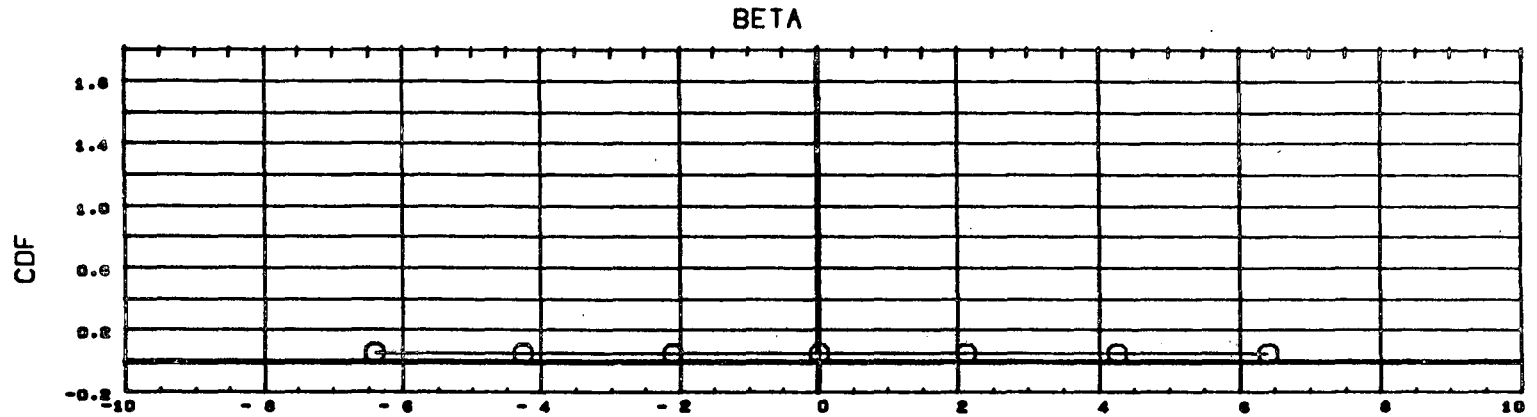
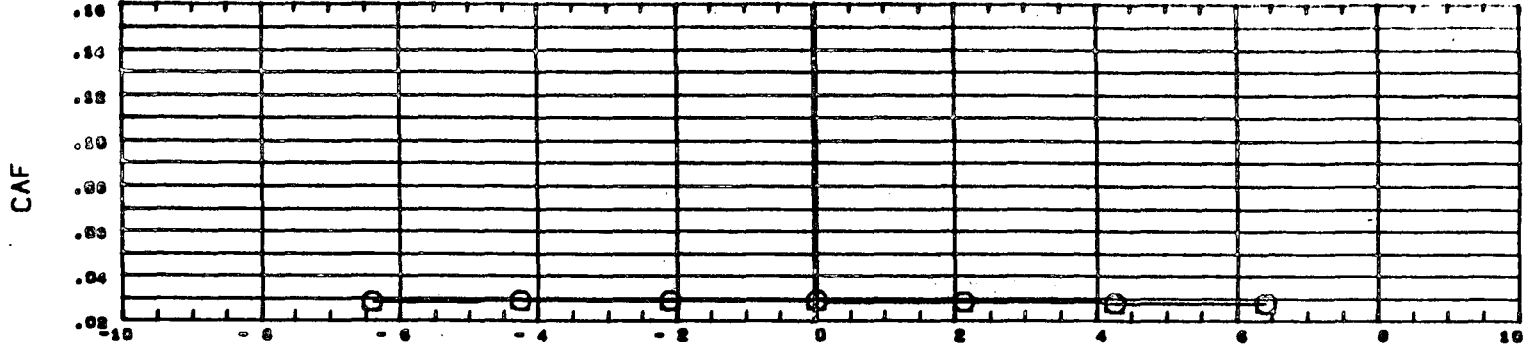


SYMBOL \square NACH 1.197 ALPHA 15.000
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REFERENCE INFORMATION
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 LREF 4.5080 IN.
 BREF 5.6550 IN.
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 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE 6C

LATERAL STABILITY



SYMBOL \square MACH 1.197 ALPHA 15.000

REFERENCE INFORMATION
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DATA HIST. CODE 6C

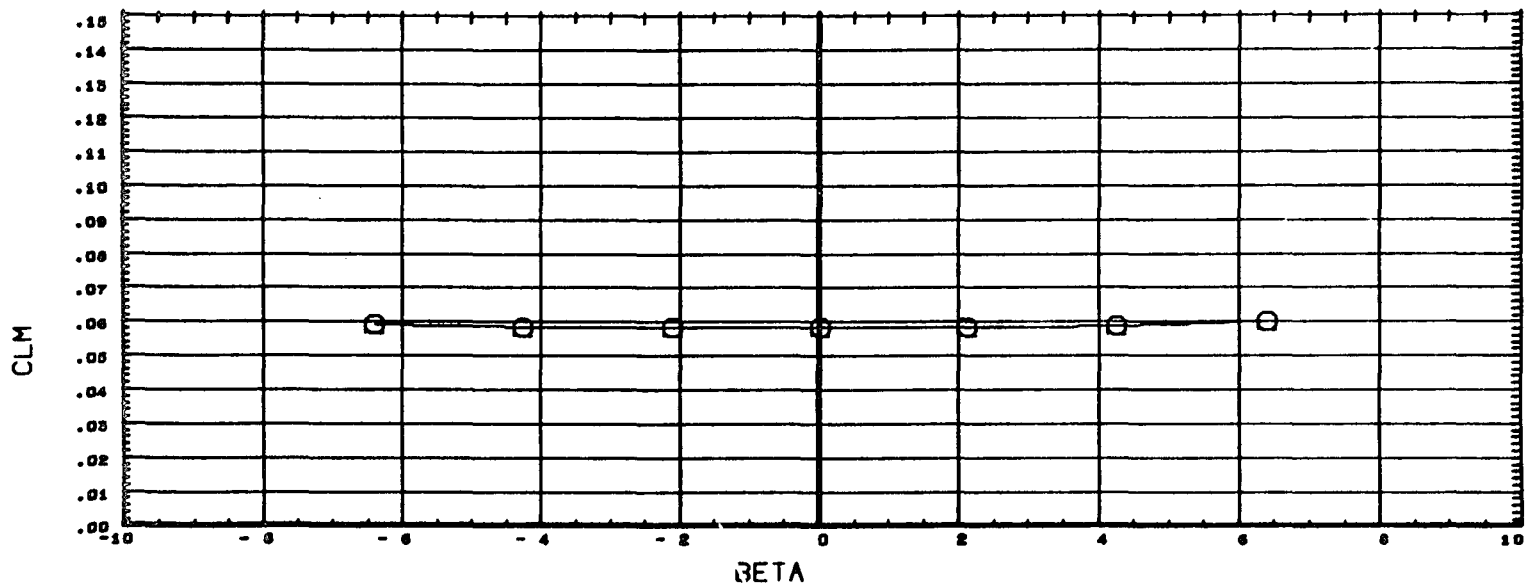
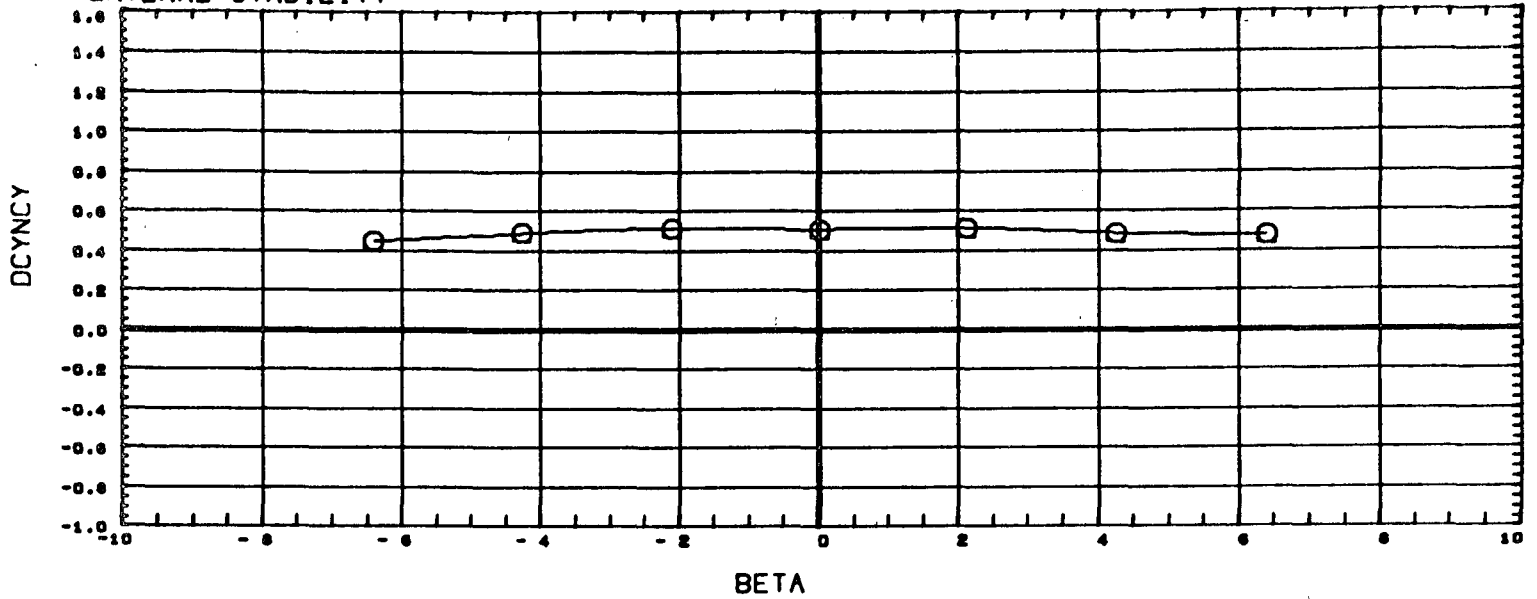
M513-MSFC MODELAR1216I-2

B5CS1

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LATERAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 O 2.197 ALPHA 15.000

REFERENCE INFORMATION
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 LREF 4.5080 IN.
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DATA HIST. CODE 6C

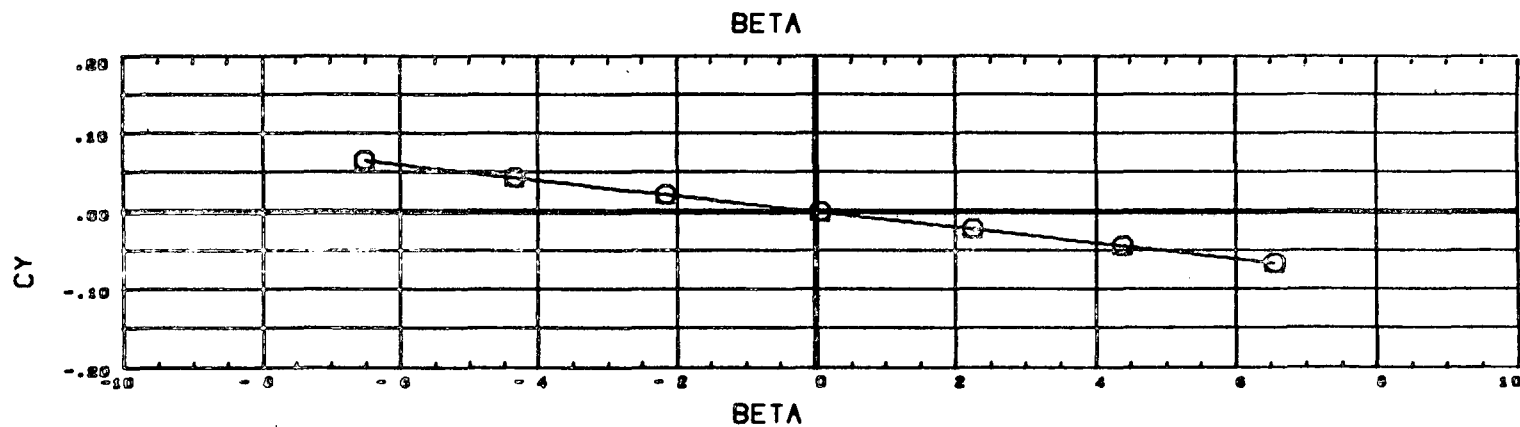
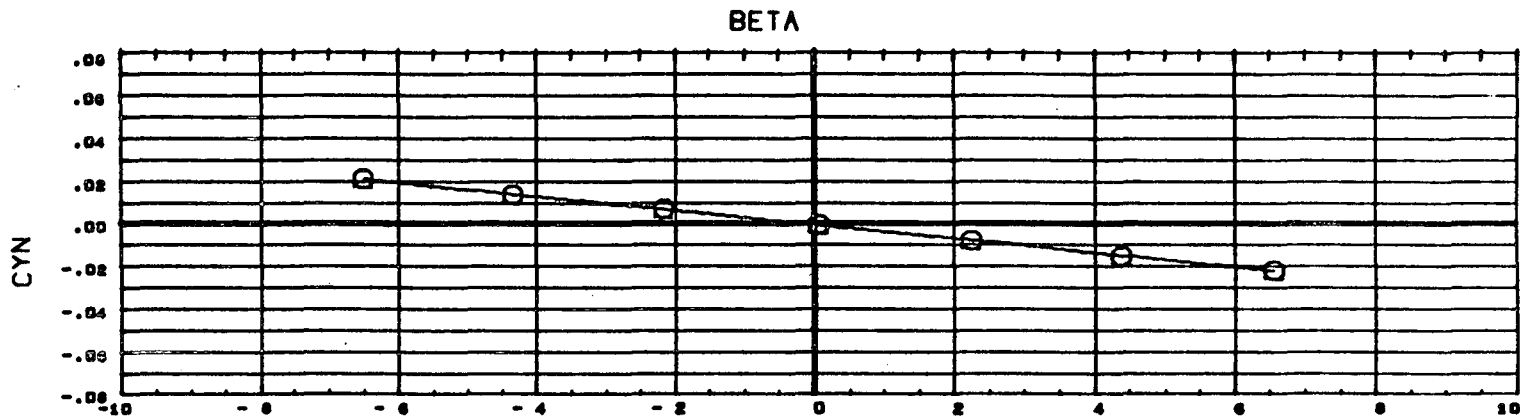
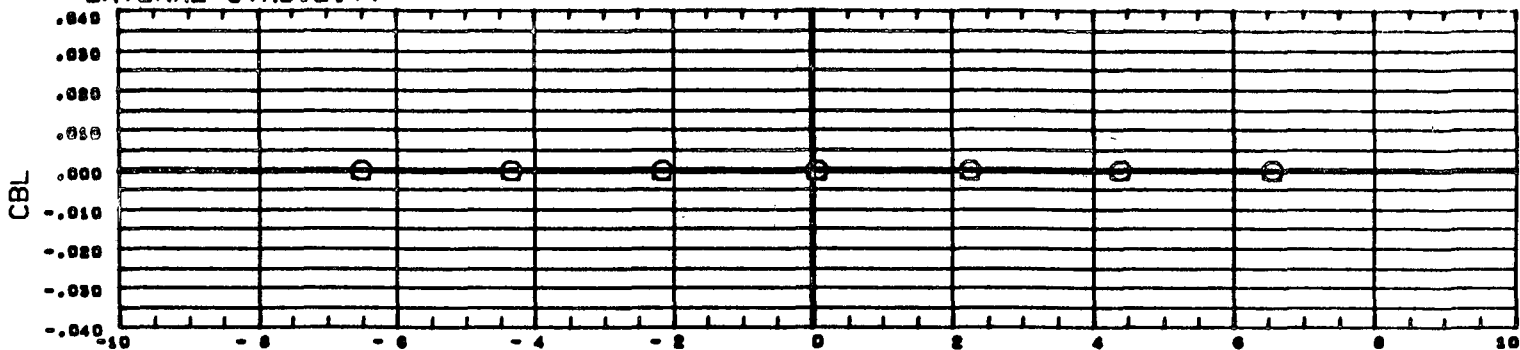
M513-MSFC MODELAR1216I-2

B5CS1

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LATERAL STABILITY



SYMBOL \bigcirc MACH 1.992 ALPHA 25.000
 PARAMETRIC VALUES

REFERENCE INFORMATION
 SREF 14.6636 89. IN.
 LREF 4.9060 IN.
 BREF 9.6550 IN.
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 SCALE 0.0034

DATA INST. CODE GC

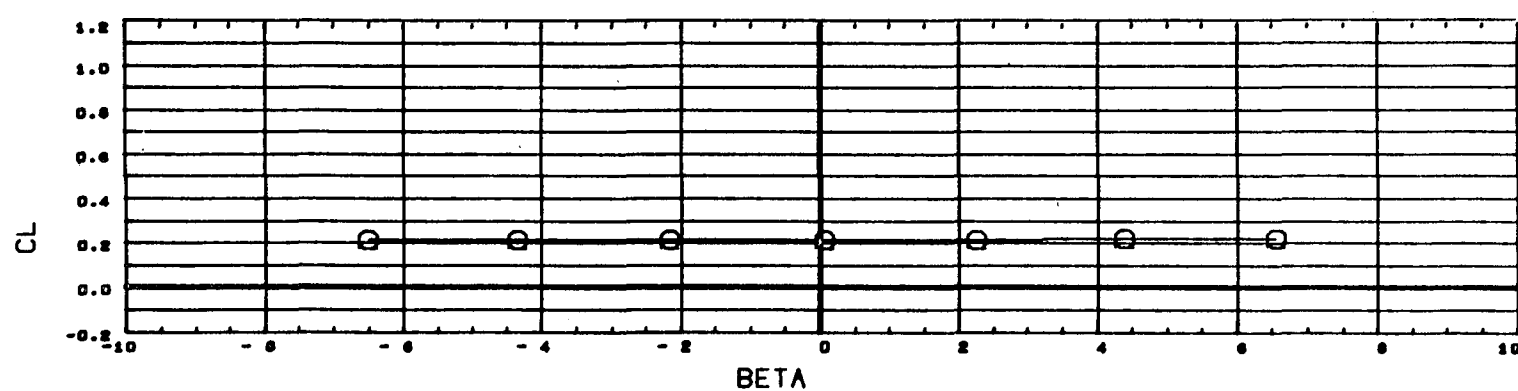
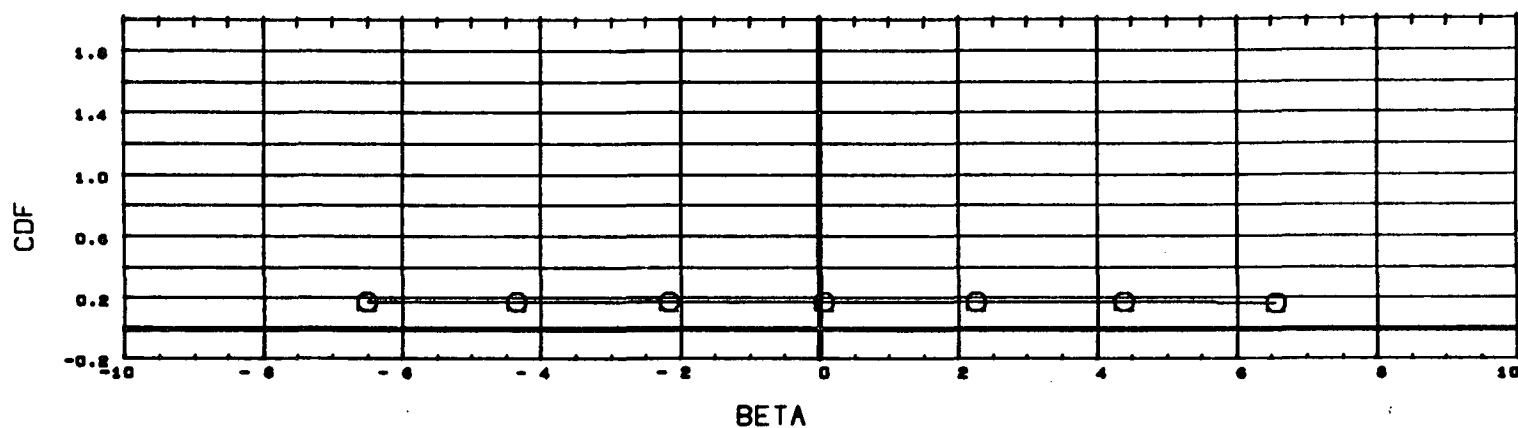
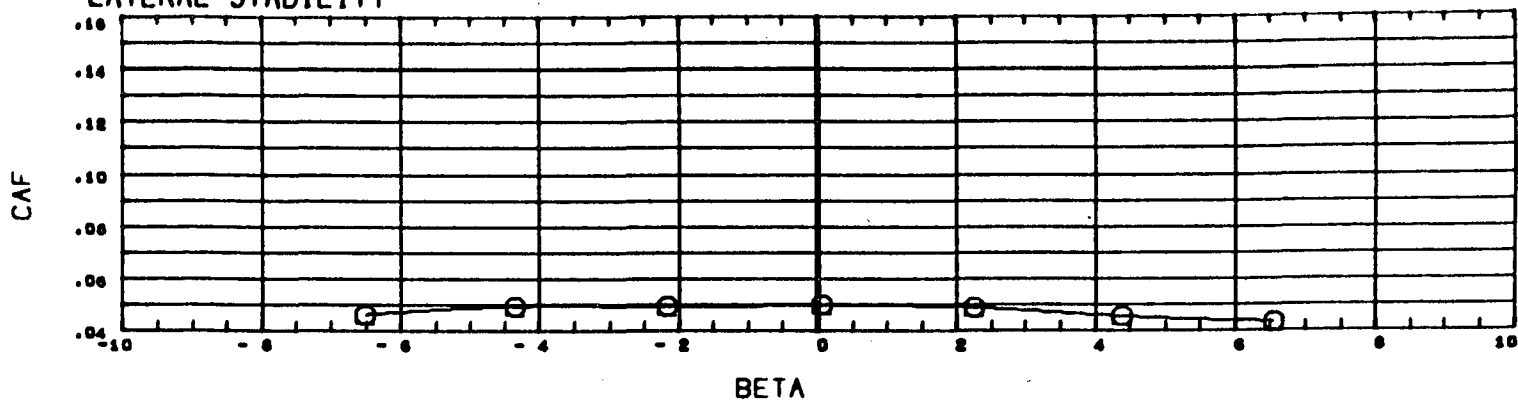
M513-MSFC MODELAR1216I-2

B5CSI

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LATERAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 O 1.952 ALPHA 25.000

REFERENCE INFORMATION
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 LREF 4.9080 IN.
 DREF 5.6550 IN.
 XHRP 1.4821 IN.
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 SCALE 0.0034

DATA HIST. CODE 6C

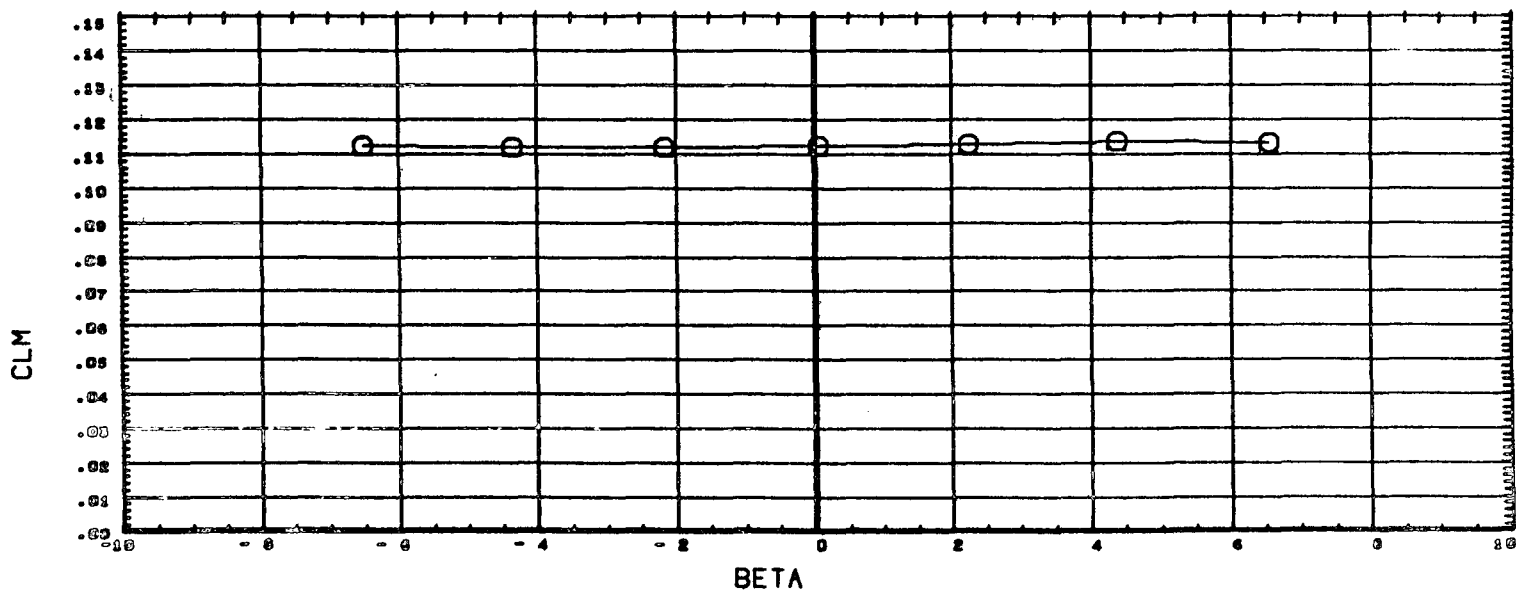
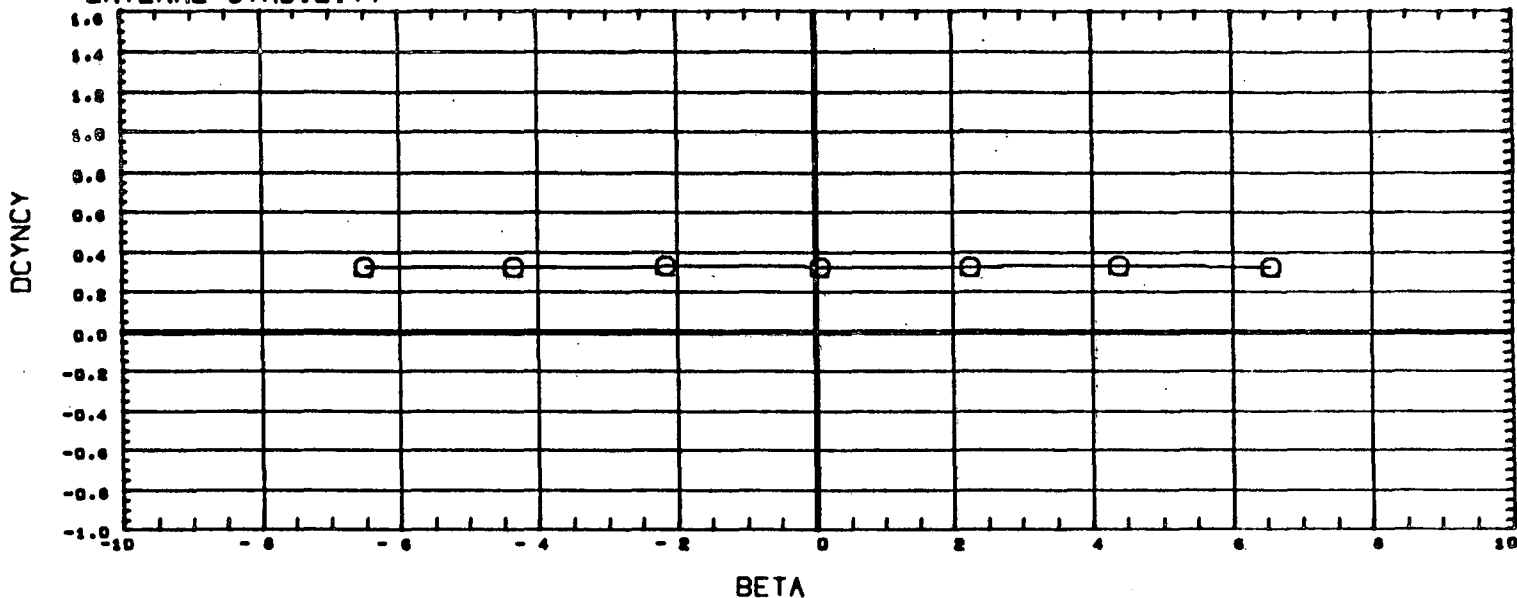
M513-MSFC MODELAR12161-2

B5CS1

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SYMBOL MACH PARAMETRIC VALUES
 ○ 1.952 ALPHA 25.000

REFERENCE INFORMATION
 SREF 14.6836 00. IN.
 LREF 4.9080 IN.
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 SCALE 0.0034

DATA HIST. CODE GC

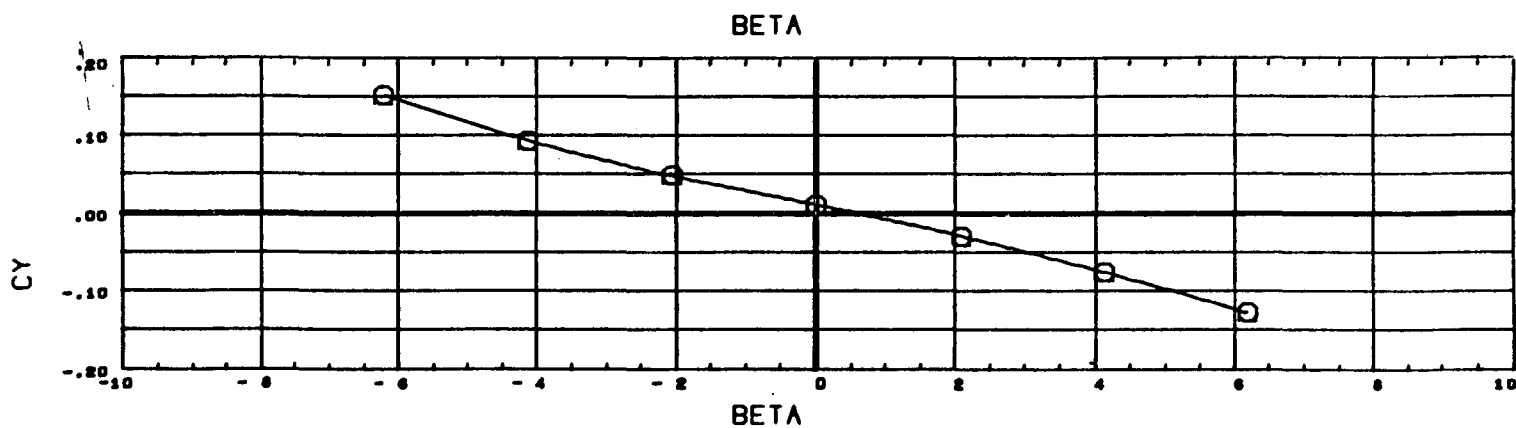
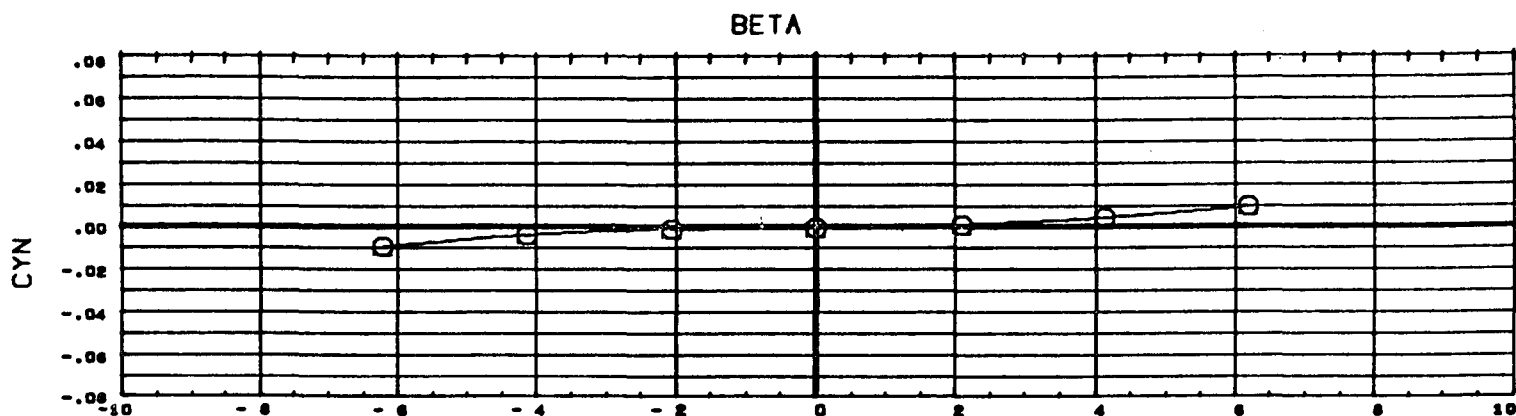
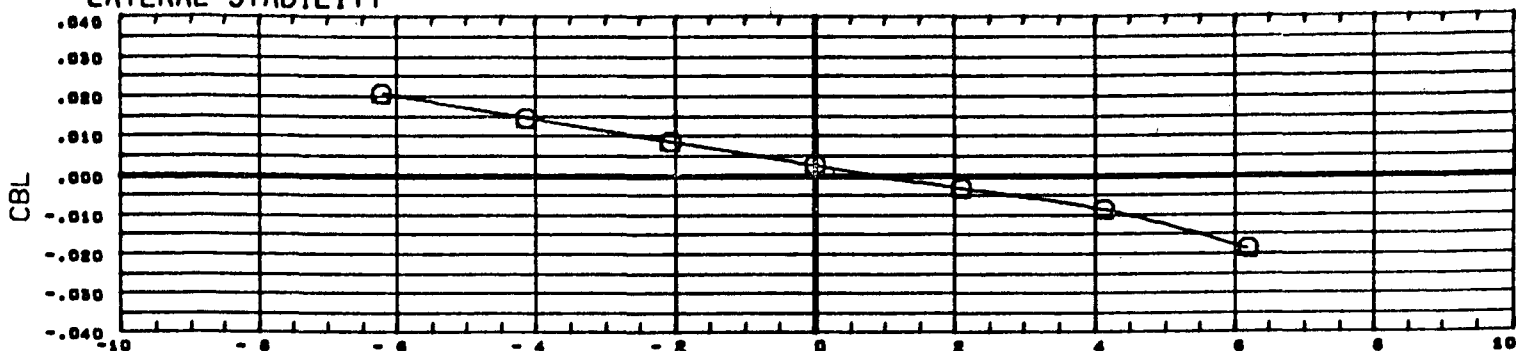
M513-MSFC MODELAR12161-2

B5061

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LATERAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
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		RUDDLR	30.000	0.000

REFERENCE INFORMATION		
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BREF	5.6550	IN.
XMRP	1.4821	IN.
YMRP	0.0000	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

DATA HIST. CODE GC

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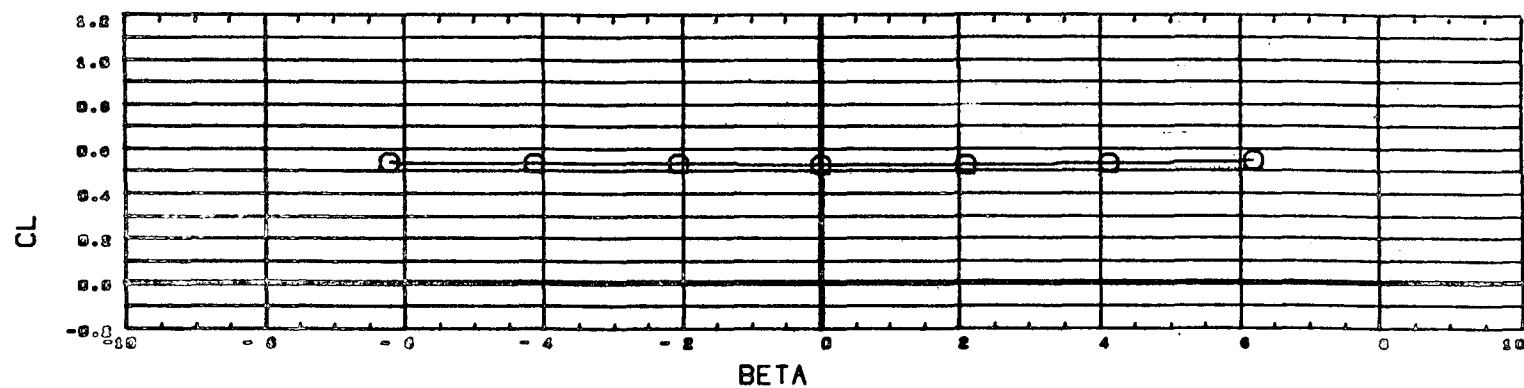
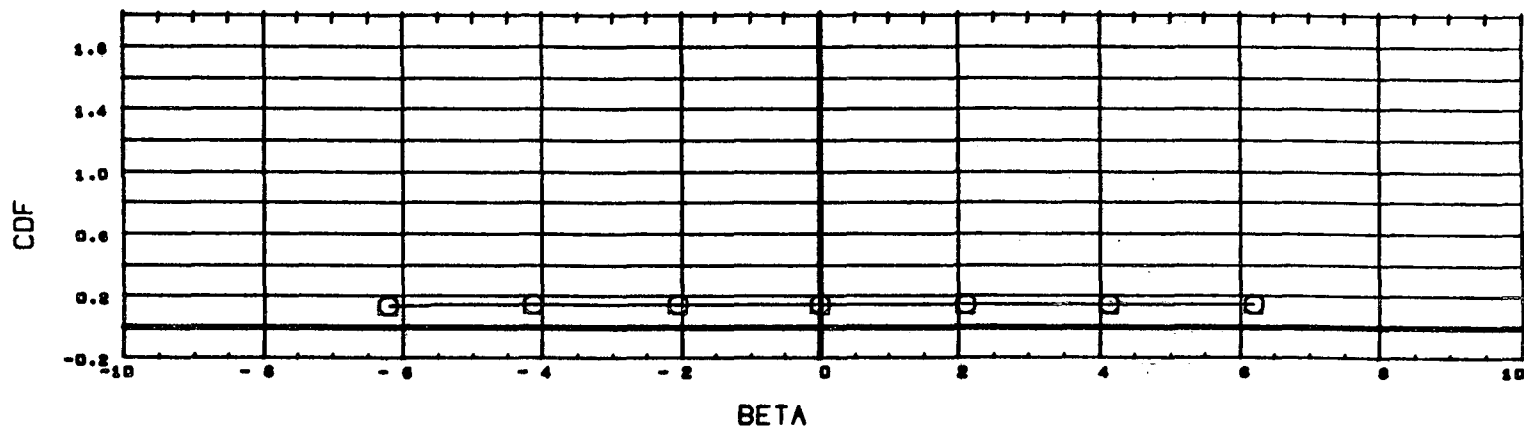
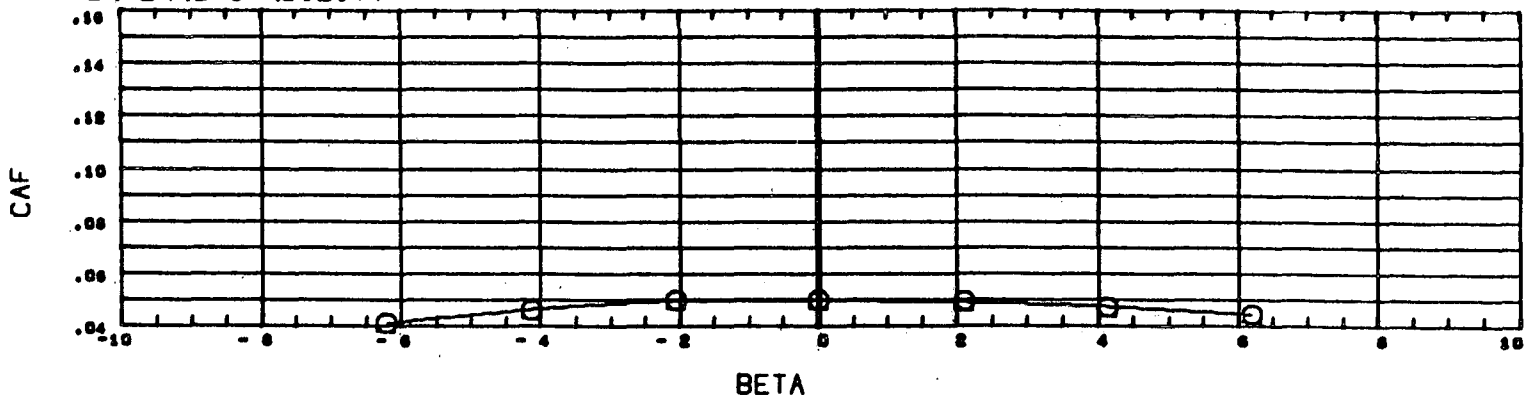
(C5327G)

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LATERAL STABILITY



SYMBOL \bigcirc HACH 0.003
 PARAMETRIC VALUES
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 RUDFLR 30.000

REFERENCE INFORMATION
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 SCALE 0.0034

DATA M89T. CODE 6C

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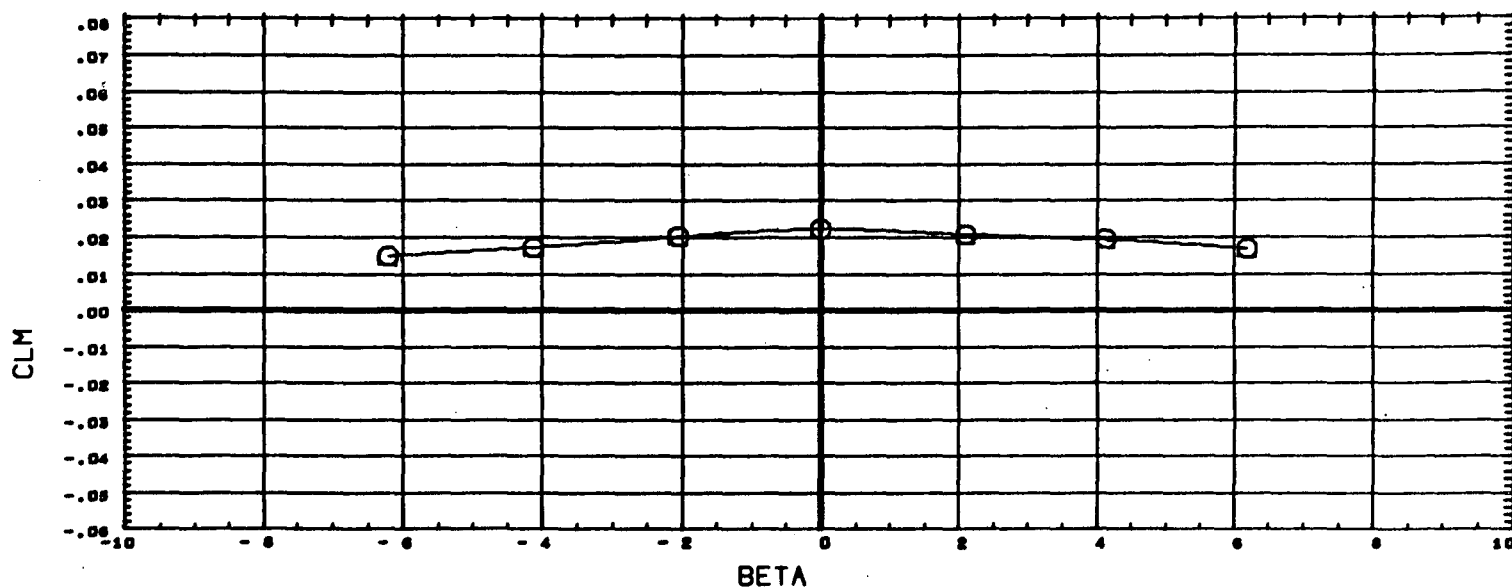
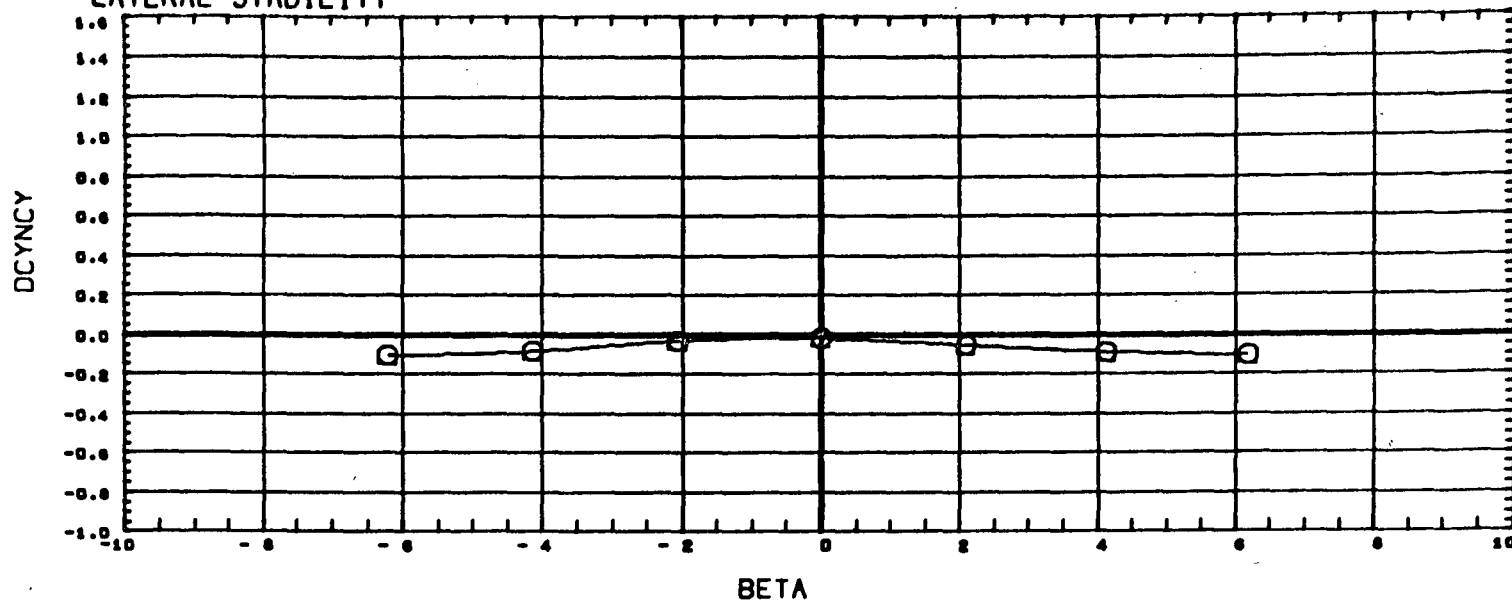
(C5327G)


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LATERAL STABILITY



SYMBOL  MACH 0.605
 PARAMETRIC VALUES
 ALPHA 10.000 RUDDER 0.000
 RUDFLR 30.000

REFERENCE INFORMATION
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 LREF 4.8080 IN.
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 YHRP 0.0000 IN.
 ZHRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE GC